RAILROAD GAZETTE

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Contributions.

Some Things to be Learned at Home.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In several recent articles on Street Paving and Street Cleaning in *Harper's Weekly* and other Eastern journals I notice enthusiastic description of a grooved street-car rail, their authors have found in Vienna. It is a common fault with New York writers to think that if a certain thing is not to be found in the Metropolis, it is not used elsewhere in America and they therefore blunder into telling us about wonderful contrivances and methods in Europe that are common, in sometimes a dozen cities of their own country. The "Vienna" rail, illustrated like a remakable curiosity, is one of these instances, grooved rails being much used in Cincinnati and several other large cities. It would be wise for some of these writers to examine municipal features nearer home before exploiting foreign things we know all about.

X. Y. Z.

The Moral Side of the Deep Waterway.

PHILADELPHIA, Feb. 13.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The question raised by Professor Raymond as to the right of the state to construct a line of communication of greater economy and capacity may I think be answered in the Yankee fashion by asking another—to wit Is it right to neglect our opportunities, to bury our talents in a napkin, and to neglect to utilize and develop to their utmost extent the provisions made by an allwise Creator for the benefit of mankind? Is it not the duty of an engineer, from the very definition of his profession, to apply the resources of nature to the wants of man? Is it morally wrong to improve and cheapen the cost of transportation for the benefit of humanity? If so, then every railroad which makes an improvement that enables it to carry more cheaply than its competitor is working an injury to that organization and committing an immoral act, lawyers and moralists to the contrary notwithstanding. Then all progress which disturbs vested rights, without direct compensation, is wrong and the inventor should divide his profits with his competitors in his line of business.

What would become of the stimulus to business if this principle prevailed? What shall be said in defense of the patent law, giving an individual a monopoly of his invention for a term of years because he makes a better article than his competitors are able to produce? When it is seen that a waterway can save sixty per cent. on the cost of moving the necessaries of life by rail, shall any one assert that it is immoral to take advantage of this enormous economy for the benefit of mankind merely because railroads are believed to have vested rights which no one and no condition should interfere with?

Fortunately, however, the result is not an injury to the railroad nor the public, for there is a broad underlying general principle which many persons interested in railroads do not appear to appreciate. The writer of your article seems to have the idea that a deep waterway would "destroy" the railroad interests. My belief after years of investigation is that, on the contrary, it will be greatly beneficial to the earning power of the railroad and I will take the liberty of submitting herewith a paper on "The Railway in Politics," just prepared, which will furnish some evidence on this question, and to refer o another paper, by the writer, published in the Proceedings of the International Deep Waterways Associati on, on "Sectionalism and Railways vs. Deep Waterways," giving stock quotations of railways having cheap water competition as contrasted with interior lines having none which should afford an index to the result of such alleged competition in benefiting the railroad.*

The sooner our country awakens to the importance of more fully utilizing her natural highways of commerce the sooner will the long expected boom of prosperity overtake us, and the harder will it be for adversity to shake our financial institutions, while it will also increase the revenues of our railroads.

L. M. HAUPT.

Setting Valves by the Light of Experience.

TO THE EDITOR OF THE RAILROAD GAZETTE:

During the past two or three years there has been much discussion, in journals devoted to mechanical matters, and in the meetings of the different railroad clubs and associations, as to the proper valve dimensions and the best method of setting valves to produce the most economical results, and the tendency seems to be in the direction of a decrease in lead, and an increase of inside clearance as compared with what has been the prevailing practice. Motive power officers of prominence have testified to the increased hauling capacity of certain specified locomotives after making alterations in this directon, able articles have been written and much sound theory advanced, the indicator has been brought into requisition, and the improved form of cards produced has been given as an additional reason for believing that motive power men have been groping in darkness concerning this very important matter, and it is well known that a number of progressive roads have adopted ¼ in. at the running cut off as precisely the proper thing, and I do not remember to have seen or heard it mentioned that any distinction should be made in this matter between engines in freight or passenger service.

Nearly a score of years' study of valve motion and practical experience as apprentice, journeyman, shop foreman and general foreman have served to convince me that no arbitrary rule governing this matter can be laid down. My first introduction to the art of valve setting began at the end of a long pinch bar simultaneously with the beginning of my apprenticeship, and it was early impressed upon my mind that an amount of special and mysterious knowledge was necessary which could be acquired by but few men. The individual who condescended to perform this duty in our little shop is remembered as an inflated personage, second in importance to the President only, who seemed to consider it beneath his dignity to do any work which could be done by an ordinary machinist. Value setting, as exemplified by this master of the art, was a stately and dignified ceremonial which lasted from two to four days before the eccentrics could be finally keyed on the axle to the satisfaction of his majesty, and which involved an amount of pinching which, to my youthful mind, seemed to render the subsequent "breaking-in" process of a new engine entirely unnecessary.

Ten or eleven years' subsequent study and practical experience of valve setting and some experience with the indicator had led me to believe that the prevailing practice, "$\frac{1}{16}$ in. for freight, $\frac{1}{16}$ in. for passenger," with inside lap from 0 to ⅛ in., was all wrong, as it produced a high compression line at high speeds which, of course, must represent negative work and consequent waste of fuel.

Experiments made while foreman of a division shop modified my views and rendered me decidedly skeptical as regards the value of the indicator in locomotive work One case which occurred quite recently may be of interest to others, as it was certainly an educator to myself. During a certain busy time within the past three years it became necessary to assign to passenger service two 17 in. × 24-in. engines with rather small boilers. This was a local run of about 150 miles where stops were frequent, which made the time on certain sections of the road as much faster than a mile a minute as it was possible for a 62-in. wheel to make. From the first it was apparent that their boiler capacity was insufficient, and the report, "engine not steaming," appeared on the book at the end of each trip, and complaints from the Superintendent to our Master Mechanic, and from him to myself, made life a burden.

The engines were just out of the shop, known to be in first-class condition, with boilers tight and clean. Every possible combination of stack, nozzle and deflecting plate which could be thought of or was suggested, was tried without success. I was convinced that they were making all the steam possible, but were not using it to advantage, and had asked permission to break the rules and increase the lead, but was refused. After two months of trouble I decided to take the bull by the horns one day after an unusually bitter complaint from the Transportation Department and selected a machinist and helper who could be trusted to keep their mouths shut, went to the roundhouse at night and changed the lead to ⅛ in. at full stroke, which gave us nearly $\frac{7}{16}$ in. at 6¼ in., the running cutoff. The train was on time at every station the following round trip and burned a ton less coal than the previous average. The second engine was at once changed to correspond, and from that time neither gave any further trouble. The changes were made without the knowledge of the roundhouse foreman or engine crews, and the M. M. and all others except the three culprits directly concerned are in ignorance to this day as to what caused the sudden and mysterious improvement in the behavior of those two engines.

By checking the coal tickets we could arrive at the difference in coal consumption before and after the change. This averaged one ton per round trip. The facts are precisely as set forth, and I give the experience for what it is worth.

Though confident an improvement would result, the radical change for the better was somewhat a surprise, though I am well satisfied as to the reason therefor. I never saw a card from either engine after the change, but I expect it would reveal a form calculated to give an indicator man a nightmare. Nevertheless the engines did the work, made the time, and burned less coal in very severe service after being given an amount of lead which is now considered excessive. I have not given any dimensions of the engines, as it is not necessary to substantiate my claim that no hard and fast rule can be given, but that local conditions and service must govern.

GENERAL FOREMAN.

*See also "The Commercial Paradox," a lecture before the Manufacturers' Club of Philadelphia, showing how the Erie Canal and other waterways were directly beneficial to railroad, by L. M. Haupt.

Argument Against the Missouri Two-Cent Fare Bill.

A portion of the address of Mr. P. S. Eustis on this subject was given in the *Railroad Gazette* of Feb 5, page 94. We have since received a copy of the argument on the same subject, delivered previously by Mr Howard Elliott, General Manager of the Burlington lines in Missouri.

Mr. Elliott began by referring to the fact that he was a citizen of Missouri, had lived there 17 years and had the best interests of the state at heart. He had consulted merchants, bankers, cattle raisers, real estate men and others and believed there was no general demand for a reduction of fares from the present three-cent. basis. There was a thorough discussion of the subject in 1889 and again in 1893 and there was no evidence of a change of sentiment since. Everyone knows that the railroads and their employees are far from prosperous.

Traveling men do not give the railroads so much money as is supposed. In Missouri they furnish only 10 per cent. of the passenger receipts. It is claimed that the cost of railroad construction has decreased; but what do the citizens want? They demand better trains, safer trains, more of them, better stations and other costly improvements. At St. Louis, Kansas City, St. Joseph and Hannibal it costs the Burlington 10 per cent. of its passenger receipts for passenger station expenses. In 1882 the Burlington ran two daily trains into St. Louis and two out; now it runs five each way, including a fast mail. This mail train is an important advantage to Northern Missouri. There has been similar improvement at the other cities. The Burlington runs a Sunday train through six counties at an absolute loss, the receipts being only 20 cents a mile. Other non-paying trains were cited. Experience shows that a reduction to two cents will not increase travel as is claimed. There may be a stimulation for a short time, but after the novelty is worn away people travel only when they need to, for pleasure or business. Low fares when made temporarily, heretofore, have been protested against by storekeepers in the smaller cities, as cheap rates take trade away from them.

While making no threat and speaking only with regret and sadness, Mr. Elliott pointed out that a reduction in fares would injure employees. In three years the number of employees in Missouri has fallen from 29,000 to 24,000. Each worker represents five persons, so that nearly 23,000 persons formerly supported by railroad work now have to get their living some other way. A similar comparison was made for the Burlington system as a whole.

The Missouri Railroad Commissioners' report shows that the railroads of the state as a whole earned in 1895 only 4.09 per cent. on their bonds and nothing on their stock. Many roads paid nothing on bonds. Experienced men in mercantile pursuits say it is not worth while to continue in any business involving commercial risk unless the income is 10 or 12 per cent. Money lent in good Missouri counties brings from 6 to 8 per cent. with no risk. The poor financial prospect of the railroads in Missouri is a bad advertisement for the state. Manufacturers seeking to enter the state ask about freight rates, stable conditions and whether there is a tendency to embarass capital once planted in the state. The Burlington is trying in every way to help the state and has lately spent considerable time and money in making and circulating a pamphlet advertising Northern Missouri.

No state in the Union has a general two-cent law. In New York this law applies only between Albany and Buffalo; in Michigan only to one road. In Wisconsin the two-cent law was repealed because the increase in travel was very small and the reduction in earnings was very large. In Illinois the Railroad Commissioners have just stated that a reduction would be unfair to the railroads, and in Ohio a few years ago a Senate Committee came to the same conclusion. In both these states railroad earnings per mile are much higher than in Missouri, while in Missouri the grades are heavier, the fuel more expensive and population less per square mile.

The cost of carrying an individual passenger cannot be computed; neither can the cost of a can of lard, but the lard manufacturer can store up his goods when there is a poor demand or can go out of business if there is no profit in it, but the railroad can do neither.

The Revised Grand Central Station, New York City.

Probably no station in the world is better known than the Grand Central Station in New York City; certainly, no station in the United States is better known. Therefore, it is hardly necessary to tell the reader that its main front is on Forty-second street; that it has several waiting rooms and ticket offices on Vanderbilt avenue and Forty-second street; that it has two or three baggage rooms placed at considerable distances apart, and that it has numerous inconveniences, most of which result from the facts that the business has entirely outgrown the station, and that it was not originally designed for just the kind of business that it is doing now. It was built about twenty-seven years ago, and in those 27 years, of course, there has been an immense development of the business of the New York Central, the New York, New Haven & Hartford and the Harlem, which roads the station serves. The passengers handled, in and out, now number 11,476,000 a year.

For several years plans have been considered for a revision and enlargement of the station, and as long ago as 1890 a plan was published in the *Railroad Gazette* (May 16) which, however, was deferred and now has been abandoned for one much more comprehensive. Recently Mr. Webb, Third Vice-President, has put the whole matter under the charge of Mr. John M. Toucey, General Manager, the engineering details to be cared for by Mr. Walter Katté, Chief Engineer, and Mr. Bradford L. Gilbert was selected as the architect of the revised station. Of Mr. Gilbert's special qualifications for such work it is unnecessary to speak. Probably he is the best known railroad station architect in the country, and he has designed some of the largest and many of the handsomest stations built in the last decade. In passing we may add that he was the first architect to use the "skeleton" construction in New York, his plans for the "Tower" building having been filed in 1887. Mr. Jenney had used cast-iron columns and steel I-beams in the Home Insurance building in Chicago in 1884; but Mr. Gilbert appears to have reinvented this general form of construction for his Tower building.

General View of the Revised Grand Central Station—New York City.

The general scheme of rebuilding the Grand Central station contemplates the consolidation of the passenger and baggage business of the three railroads in a general waiting-room, with the necessary auxiliary rooms and a general outgoing baggage-room. Further than this, the office capacity of the building will be greatly increased by the erection of additional stories, and the elevations will be much improved in appearance. Elevators will be put in to serve the offices; new plumbing will be put in throughout; also a new steam heating and power plant, and electric lighting for the entire station—offices, train-shed and yards—as well as a plant for making from 20 to 40 tons of ice a day.

At the south end of the present train-shed will be the union waiting-room or rotunda, 100 ft. wide × 200 ft. long and upward of 50 ft. high. This is said to be the largest waiting-room in the world. Some comparative figures follow: General waiting-room proposed, South Terminal station, Boston, 65 ft. wide × 265 ft. long; ceiling, 24 ft. high to bottom of supporting beams; St. Louis Union station, general waiting-room, 76 ft. × 120 ft.; one story high; grand hall, 76 ft. × 120 ft., extreme height 65 ft.; Illinois Central, Chicago, 100 × 150 ft. × 75 ft. high.

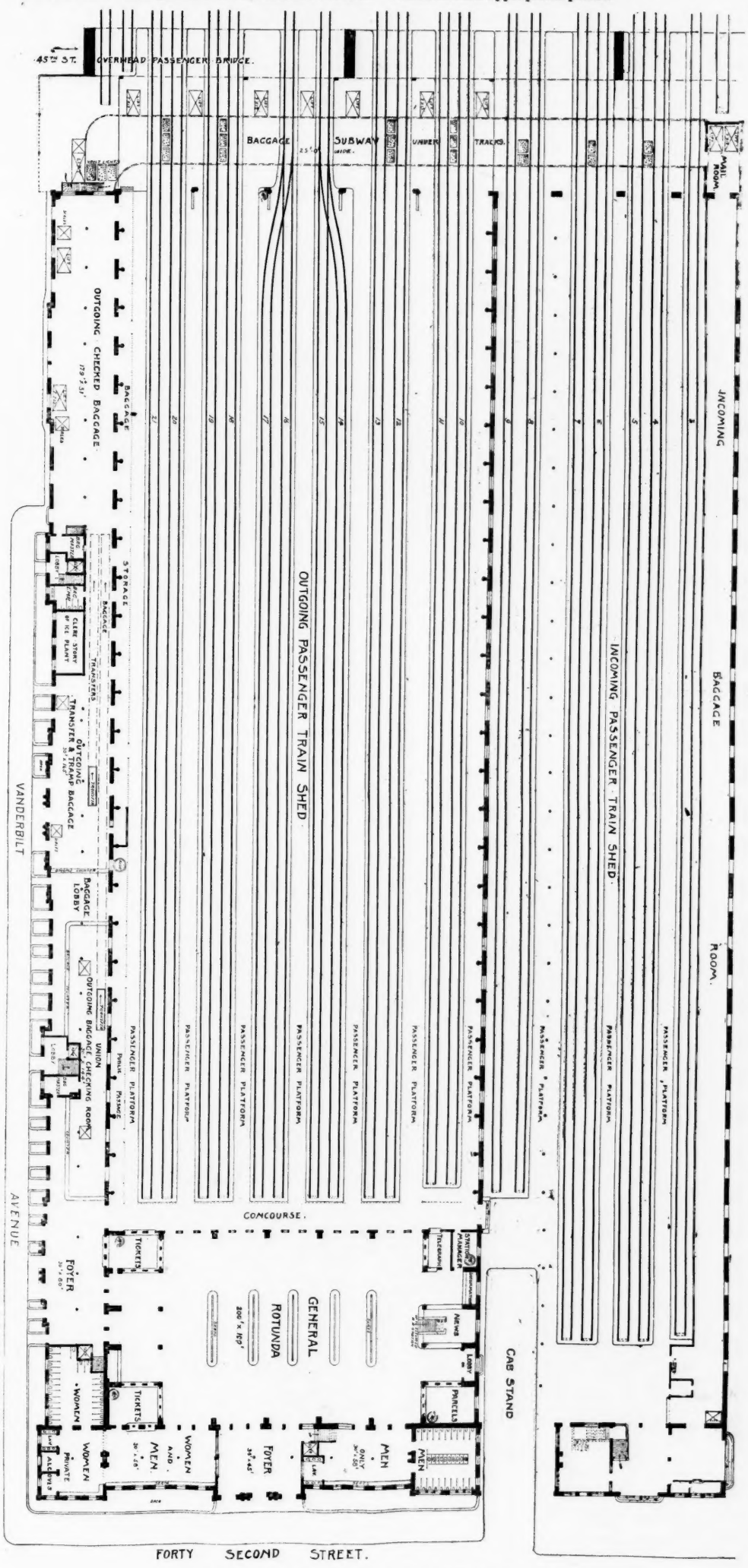
This will be entered from the Forty-second street side through a foyer 35 × 45 ft. On the east, from the present incoming station, access will be had through vestibules 8 × 10 ft. each, and from the west, on the Vanderbilt avenue side, through a foyer 31 ft. × 65 ft. The entrances on three sides of the waiting-room not only make that room convenient of access from all directions, but passengers who have already secured tickets can go directly to their trains without passing through the rotunda at all. The ticket inspectors will be placed outside at the gates leading to the train platforms. This change in itself will be a great addition to the comfort of the passengers. Opening off from the rotunda is a general waiting-room 30 × 58 ft., and off this will open a room 34 ft. square for women, and a toilet room 20 × 30 ft. There will also be three curtained rooms, in charge of a maid, which will be useful in case of sickness or fatigue. A large smoking-room 30 ft. × 58 ft. is provided for men, and a toilet room 35 ft. square. The ticket offices along the north side of the rotunda will provide over 20 ticket windows. Of course there will be parcel rooms, and all the other numerous offices and conveniences which are now found desirable in general passenger stations. A capacious stairway of marble will connect the waiting

Rotunda of the Revised Grand Central Station, New York City.

room at the southeast corner with the present overhead passage to the elevated trains, and it is proposed to provide, besides, an elevator from the present incoming platform alongside the stairways to the elevated station.

The combined waiting-rooms of the station as it is to-day have about 12,000 sq. ft. of area. The combined waiting rooms of the new station, exclusive of toilets and platforms, will have an area of more than 28,000 sq. ft.

The internal finish of the rooms which we have described will be quite up to modern practice; that is, tile floors, and tile and marble wainscots, cherry and oak wood, etc. Comfortable armchairs and rocking chairs, writing desks and tables and open fireplaces will all be found in their appropriate places.



General Plan of the Revised Grand Central Station, New York.

The roof and upper portion of the rotunda will be steel and iron and glass. There will be six steel arches with a clear span of 100 ft. supporting the dome. On these arches and under the cornices will be arranged electric lights. Daylight will be had through leaded glass on the sides, ends and dome of the roof. The architectural treatment of the rotunda will be classical, with Ionic columns, molded pilasters and a general bold treatment combined with a refinement of classic detail.

The sidewalks opposite all the entrances will be protected by awnings with light iron framework and glass roofs, and a covered cab stand about 30×60 ft. will be placed at the east side of the rotunda.

One of the special conveniences of the new station will be the method of handling outgoing baggage, which amounts to more than a million pieces a year. All the outgoing baggage of the three roads will be consolidated on the Vanderbilt avenue side of the station. The public room, here, will be easily accessible from the main entrances and close to the ticket offices and to the drives. The baggage will be taken at various points and carried by movable sidewalks under the floor, running at about 200 ft. a minute, to the basement at the extreme north end of the building, where it will be transferred to baggage trucks and carried through a subway about 25 ft. wide, underneath the entire 20 tracks outside, and north of the present trainshed. At each train platform will be a baggage lift 7 ft. × 18 ft., which will raise the loaded trucks to the car level. This subway will also connect with the present incoming baggage-room at Forty-fifth street and Depew place.

The central tower facing Forty-second street will be removed. The four towers on the corners at Forty-second street and opposite Forty-third and Forty-fourth streets on Vanderbilt avenue will be retained, but the architectural treatment of them will be considerably changed, and they will be lifted practically 50 ft. higher than now, that is to say, 150 ft. above the curb. Indeed, above the moulded level of the present second story ceiling, the entire upper part of the station will be removed, the new superstructure being of fireproof construction and carried on independent foundations when necessary. It is proposed furthermore to fireproof the present cast-iron columns throughout the building as well as the floor beams.

The office space now occupied above the first floor is approximately 55,000 sq. ft. The remodeled building will have about 153,000 sq. ft. of offices proper.

The treatment of an old building with good architectural effect is a hard problem, especially where a portion of the old building is to remain unchanged. Mr. Gilbert's effort has been to do away, as far as possible, with any appearance of old work, and to carry out the entire structure on simple and effective lines with classical details throughout. Each story of the towers is faced with pilasters, with enriched cornices suitable to the different orders used. The main cornice is at the fifth-story level, with Corinthian pilasters facing the third and fourth-story walls.

The entire exterior of the plain brick wall panels of the building will be covered with a Portland cement stucco, the aim being to get a substantial appearance without, however, attempting to imitate stone. This treatment is common enough abroad, but probably it has never been tried on so extensive a scale in this country. The effect will be a solid, rough gray background, with trimmings of white.

The power plant will provide upward of 1,750 H. P This will supply the power for a duplicate electric lighting equipment for the whole building and for the yards and offices outside and for the 15 baggage lifts for trucks, as well as for forced ventilation. The building will be heated by exhaust steam and the plumbing will be absolutely new throughout. The new work on the building proper, exclusive of the power plant, will cost upward of $500,000, but it is almost impossible to say what the alterations in the existing structure and the rock excavation to the baggage subway, etc., will cost in addition to this.

For convenience in carrying on the work the architect has arranged to use a portion of the private park on Vanderbilt avenue, between Forty-third and Forty-fourth streets, connecting this with the station building at the present roof line by means of a high heavy bridge across Vanderbilt avenue. Two tracks, about 800 ft. long each, will run the length of the building over the roof and upon this the material will be handled without disturbing the occupants of the present offices below the roof line. A secure passageway will be carried from the present New Haven and Harlem waiting-rooms to the new platforms and the work of building and completing the general rotunda will be carried on without interfering with passengers.

Some rearrangement of the tracks in the train-shed will be made.

This costly enlargement, involving such radical changes, has become necessary, first, for the purpose of providing room for the general office force, several departments being now housed in hired buildings; and, second, for the better accommodation of the constantly growing passenger business. But, in so far as the latter feature is concerned, the change from three small waiting-rooms to one large one is even more important than the simple increase of floor space, for it will make it possible to greatly economize time and space in handling trains. The present waiting-room of the New York Central being at one side of the train shed, but few tracks can be made available for it, and the waiting-room of the Harlem division being not much better situated, the train shed has to be used as three separate stations instead of as one. By receiving and delivering all passengers at the end, the station will be made a "head-house" in fact, and inward and outward trains can use each other's tracks indiscriminately

whenever necessary. This will permit the running of many suburban trains out from the same track that they came in on and thereby afford much relief to the crowded yard.

Promotions on the Pennsylvania.

The promotions following the election of Mr. Thomson to the presidency of the Pennsylvania Railroad are noted in the usual department in this issue, and brief personal sketches of the men promoted are given below.

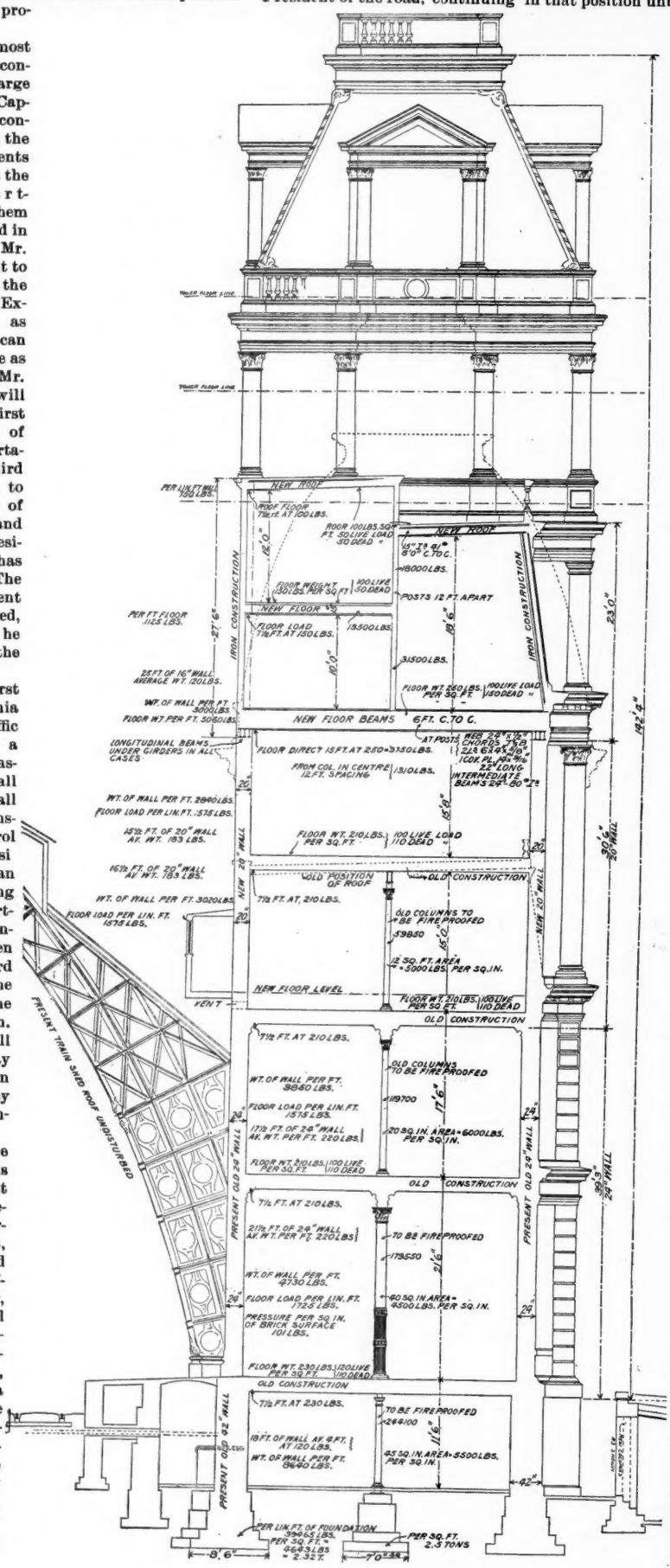
It will be observed in most cases the gentlemen concerned continue to discharge their old functions. Captain Green retains his control of the Treasury and the Accounting Departments and Mr. Pugh still has the Transportation Department, though each of them has taken a step upward in the vice-presidency. Mr. Rea, now First Assistant to the President, remains the President's Engineering Expert, and Mr. Joyce as Freight Traffic Manager can hardly enlarge his sphere as General Freight Agent. Mr. Thomson, however, it will be remembered, had, as First Vice-President, charge of both traffic and transportation, and Mr. Pugh as Third Vice-President reported to him. This arrangement of duties is now changed and the new Third Vice-President, Mr. Prevost, has charge of traffic only. The details of this arrangement are not officially announced, but it is presumed that he will report directly to the President.

This is, we believe, the first time that the Pennsylvania Railroad has made its traffic the exclusive charge of a Vice-President. Scott, Cassatt and Thomson were all transportation men, and all retained control of the transportation on taking control of the traffic as Vice-Presidents. It was, perhaps, an indication of the growing importance of the department of traffic to the Pennsylvania Railroad when some years since the Third Vice-President relieved the First Vice-President of the details of transportation. That traffic matters are still of the first importance may be gathered by the creation of a Traffic Vice-Presidency and of a Freight Traffic Manager.

The conservatism of the Pennsylvania Railroad is shown, however, in the fact that it fills its Traffic Vice-Presidency with a Transportation man. Mr. Prevost, who has successively filled on the Pennsylvania the offices of Assistant Engineer, Superintendent, General Superintendent, General Superintendent of Transportation and General Manager, has for several years been a prominent member of the American Railway Association, but we cannot recall the mention of his name in connection with any traffic question. Doubtless, however, in the Pennsylvania "happy family" he has had an opportunity of considering many points in connection with traffic, as he now assumes full control of this department, and the Freight Traffic Manager and General Passenger Agent will report to him.

Mr. Prevost's promotion left vacant the position of General Manager which is filled by Mr. Hutchinson, who as General Superintendent of Transportation has frequently acted as General Manager in Mr. Prevost's absence. The office of General Manager on the Pennsylvania Railroad, as on most American railroads, is a purely transportation office.

John P. Green was born in July, 1839, in Philadelphia. In January, 1865, he began his railroad career as Private Secretary to the First Vice-President of the Pennsylvania, continuing in that position until 1866, when he was made Secretary and Treasurer of the Milwaukee & Minnesota Railway. In 1869 he returned to the Pennsylvania to become again Private Secretary to the First Vice-President. In 1874 he was made Assistant to President Scott, succeeding George B. Roberts in that position. In October, 1882, he was made Fourth Vice-President of the road, continuing in that position until 1886, when he was made Third Vice-President. In March, 1893, he was made Second Vice-President, which position he has held up to his present appointment.



Cross-Section of One Tower—Grand Central Station.

(Outline of Old Tower dotted.)

Charles E. Pugh was born in 1841 in Unionville, Pa. He entered railroad service in October, 1859, and has been connected with the Pennsylvania ever since. His first position was Station Agent at Newport, Pa., which he held until 1862, being then appointed a passenger conductor. He was than appointed Train Dispatcher on the Philadelphia Division, and in 1864 was made Assistant Trainmaster of the same division. In 1870 he was appointed General Agent at Philadelphia and held that office for nine years. From 1879 until 1882 he was General Superintendent at Altoona. On Oct. 1, 1882, he was made General Manager of the Pennsylvania Railroad system east of Erie and Pittsburgh, and held that office until March, 1893, when he was made Third Vice-President of the road.

Sutherland M. Prevost was born in Philadelphia in 1845. He received a technical education at the Polytechnic College in that city, and entered railroad service in 1863 as rodman on the engineer corps of the Philadelphia & Erie. In 1865 he was appointed Assistant Engineer of the Western Pennsylvania, remaining in that position for one year. He was subsequently Assistant Engineer of the Atlantic & Great Western, the Baltimore & Potomac and the Wilmington & Reading, and in 1868 was made Principal Assistant Engineer of the last-named road. In 1871 he entered the employ of the Pennsylvania as Assistant Engineer of Maintenance of Way of the Philadelphia Division, and has remained with the road ever since. He served as Superintendent of the Bedford, the Middle and the Philadelphia divisions successively until, on Oct. 1, 1882, he was made General Superintendent of the Pennsylvania Railroad Division. In 1885 he was made General Superintendent of Transportation, with supervision over the Northern Central, the Philadelphia, Wilmington & Baltimore and all the Eastern lines. In March, 1893, he was made General Manager of the Pennsylvania Railroad system.

Joseph B. Hutchinson was born in 1844 in Bristol, Pa. He graduated from the Polytechnic College of Pennsylvania, and entered the service of the Pennsylvania in June, 1863, as rodman on the Mifflin & Center County road. In August, 1864, he was made an Assistant Engineer, and in May of the following year Assistant Engineer of Maintenance of Way and Construction on the same road. From 1879 to 1891 he served as Superintendent of the Lewistown, Frederick, Altoona and Western Pennsylvania divisions. In 1893 he was appointed General Superintendent of Transportation of all lines east of Pittsburgh and Erie.

William H. Joyce was born in 1854 in Baltimore, Md. He entered railroad service in 1869, beginning as a messenger boy in a local freight depot of the Northern Central road. In 1874 he was made Clerk in the general freight office of the Northern Central, and in 1878 Chief Clerk. From 1882 to 1885 he was Division Freight Agent of the Northern Central and of the Baltimore & Potomac. In 1885 he was made Coal Freight Agent of the Pennsylvania, and in 1888 General Freight Agent of the same road.

Samuel Rea was born in 1855, at Hollidaysburg, Pa. Previous to 1888, he served in various capacities in the engineering department of the Pennsylvania, and then for one year served as Assistant to the Second Vice-President of the road. From 1889 to 1891, he was Vice-President of the Maryland Central, and for a part of that time also Chief Engineer of the Baltimore Belt Line. In June, 1892, he was made Assistant to the President of the Pennsylvania, which position he holds at the present time.

William A. Patton was born in Huntington County, Pa. He entered railroad service in 1865, in the office of General Superintendent of the Pennsylvania at Altoona. From that time until 1884, he served as Chief Clerk to various officers of the company, and on April 1, 1884, was made General Assistant to the President and also Vice-President of the New York, Philadelphia & Norfolk.

Edward T. Postlethwaite entered the employ of the Pennsylvania about 25 years ago as stenographer to Mr. Thomson. In 1874 he became his confidential and chief clerk, a position which he has held to the present time. In his new position he will hold the same relations to Mr. Thomson which have previously existed, and will also have charge of the details of the office management.

Maine Railroad Commissioners' Report.

The Railroad Commissioners of Maine, Joseph B. Peaks, Benjamin F. Chadbourne and Frederic Danforth, have issued the thirty-eigth annual report of the board. It contains as a frontispiece a portrait of Mr. William A. Allen, late Chief Engineer of the Maine Central.

The length of railroad in Maine on June 30 was 1,719 miles, an increase of 92 miles in 12 months. No less than 146 miles of the railroad in Maine is 2-ft. gage. The length of street railroad in operation is 131 miles, an increase of 37 miles since the last preceding report. The street railroads have about 8 miles of second main track. Brief notes are given of each new railroad and new street railroad, and there are inspection notes of all railroads, old and new. The railroads are all "safe for their traffic," but the extraordinary freshets of last spring damaged them so much that many improvements had to be postponed. Four passengers, 6 employees, and 8 other persons were killed on the (steam) railroads during the year, and 11 passengers, 61 employees and 28 other persons were injured. Only three passengers were killed in train accidents and these three were emigrants riding on the platform of a car contrary to the express instructions of the trainmen and of an interpreter who was in charge of them. On the street railroads no persons were killed, but there were injured 11 passengers, 4 employees and 3 other persons.

The report contains a brief discussion of electric mo-

tive power and half a dozen direct-process cuts showing electric cars of the Nantasket Beach road, and the Baltimore & Ohio electric locomotive.

The report gives financial and traffic statistics of the "business done in Maine." The separation of this business from the whole of that reported by the railroads, including the traffic outside of the state of Maine, is asserted to have been done "with great care," and it is claimed that the figures are very nearly correct. Following are the principal items:

	1896.	1895.
Gross earnings	$8,111,507	$7,611,127
Passenger train mileage	3,497,709	2,937,231
Freight train mileage	2,989,320	2,713,291
Passenger mileage, *thousands*	136,435	128,942
Freight ton mileage, *thousands*	390,613	358,340

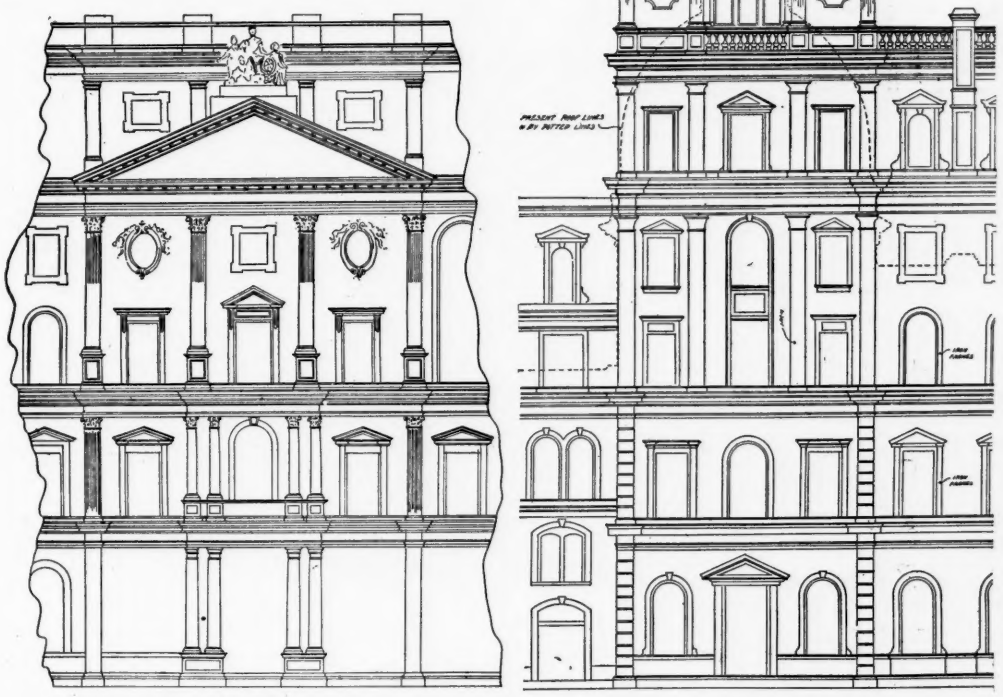
Street Railroads in Massachusetts.

The 28th annual report of the Board of Railroad Commissioners of Massachusetts relating to street railroads was presented to the legislature on Feb. 5. Annual reports for the year ending Sept. 30, 1896, were received by the Commissioners from 83 street railroad companies, which is eight more than were received in 1895. Eleven companies were organized during the last fiscal year under the general law, and eight new companies were chartered in 1896 by special act. At the end of last year 69 of the 83 reporting companies were operating their railroads, eight roads were being run by other companies under lease or contract, and but two of the entire number which reported were not in operation. Last year there was added to the mileage of Massachusetts companies about 175 miles of street railroad line, 23 miles of second main track and 14 miles of sidetrack, making a total addition of over 212 miles of road, reckoned as single track. There is at present 1,368 miles of streetrailroadi n operation in Massachusetts.

The average cost of operating a mile of main track last year was $46,041. The total income from all sources for the year was $14,900,914. The total expenditures were $14,423,012 net balance, $477,929; cash dividends declared, $2,812,846, an increase of $196,652 over the previous year. The total number of passengers carried was 282,358,943, an increase of 32,564,635 over the previous year. The average number of passengers per mile of main track operated as reported from 10 companies was 346,581; average gross earnings per car mile was 26.69 cents; net, 7.99 cents. The West End Company, of Boston, carried over 57 per cent. of all the passengers which were carried by the 83 companies. The number of passengers who rode on the street railroads exceeded the number carried on steam railroads of the state by 180,729,892. Forty-three out of the 83 companies paid from 1¼ to 10½ per cent., and 40 companies declared and paid no dividends. Ten of the railroads reported the percentage of operating expenses to gross receipts as 71.45.

During the last three years of operation wholly by horse power (1886-88), the percentage of operating expenses to gross earnings ranged from 80.04 to 82.81 per cent. In 1895, when nearly nineteen-twentieths of the mileage had been equipped for electric power, the ratio of operating expense had fallen, at first by rapid and then by slower and slightly fluctuating gradations, to 68.93 per cent. The last year it has advanced again to 71.16 per cent.

During the year 10 passengers were killed 1,114 were injured, one employee was killed and 56 were injured. The total number killed was 26; total injured, 1,740, and the total killed and injured, 1,766. This is an increase of 259 over the previous year. Nearly 27 miles of original horse-car lines were re-constructed to be operated by electric power, and there now remains about 35 miles, or less than 3 per cent., which are operated by horse power only. The report contains detailed figures as to operating expenses and receipts from the different companies. The Commissioners recommend that the duties of the Steam Railroad Inspectors as provided for by an act passed in 1894, be extended so as to include street railroads. The Boston subway and the question of grade crossings are both considered at some length in the report.



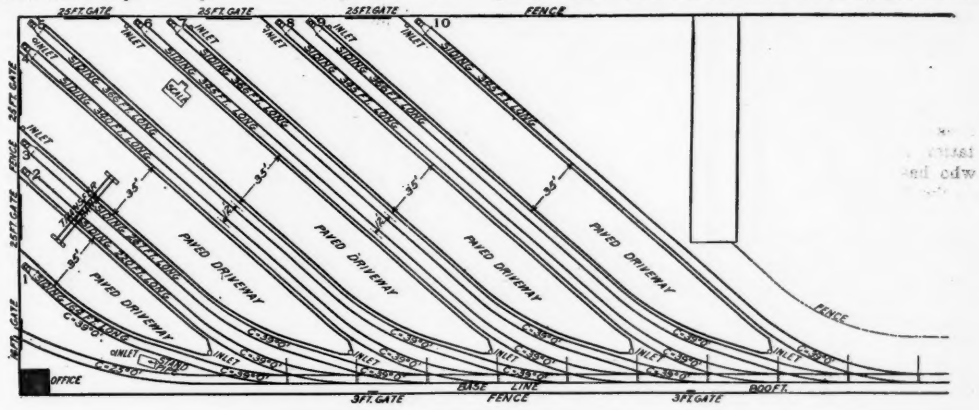
Elevation of One Tower and Part of Vanderbilt Avenue Façade—Revised Grand Central Station.

A City Freight-Yard of the Jersey Central.

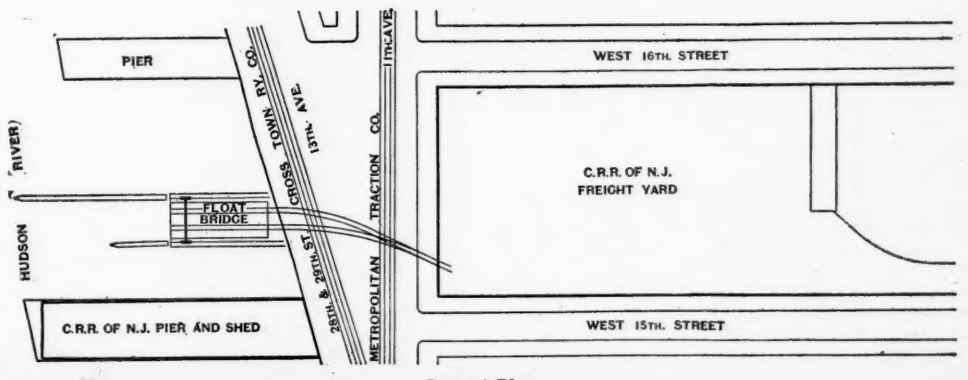
The Central Railroad of New Jersey has recently completed and opened for business a commodious freight-yard between West Fifteenth and Sixteenth streets and abutting on Thirteenth avenue, along the North River in New York City. The yard is to be operated in connection with its pier and freight-shed at foot of West Fifteenth street. The general situation and the arrangement of the yard in detail are shown by the two engravings published herewith. These show the arrangement of tracks, float-bridge and pier-shed. The situation is central and convenient for manufactories, and for shippers of many classes of freight.

In its arrangement this is one of the most convenient shipping and receiving stations for all kinds of freight in the city, for owing to the arrangement of the yard, shipments can be most expeditiously and readily handled. The driveways are 35 ft. wide and paved with Belgian blocks, which with the easy approach from Sixteenth street (which is well paved) makes the receipt and delivery of freight as easy as on or along one of the principal thoroughfares of the city. The yard is provided with a large transfer crane for the heaviest loads, and a wagon scale of 25-ton capacity. Both these are conveniently placed for the accommodation of shippers.

The yard was opened for business on the first of the year (1897), and has already done an unexpected amount of business. The property owned by the company at this point will admit of extending the capacity of the yard about 50 per cent. when business requires it, and the prospects are that in the near future the extension wil be made.



Plan of Yard.



General Plan.

West Fifteenth Street Yard of the Central R. R. of New Jersey—New York City

The Chicago & Northwestern Testing Plant.

Mr. E. M. Herr, at the January meeting of the Western Railway Club, presented a paper, "Notes from Work Done on the Chicago & Northwestern Locomotive Testing Plant," from which the following abstract is taken. The description of the plant and apparatus used in conducting tests is to be found in the *Railroad Gazette*, April 10, 1896.

This plant was originally installed primarily for the purpose of breaking in engines just out of the shops, and only secondarily as a device for testing their performance and efficiency. The latter use has been found so valuable, however, that most of the work done on the plant has been experimental.

The results obtained in breaking in locomotives for road service on this plant have not been as uniformly good as could be desired. There is no difficulty in breaking in the driving box bearings themselves and the rods and pins with entire success, but owing to the uniform position in which the engine stands while running it is not possible to have the bearing surfaces on all driving wheel hubs worn down to a perfect bearing. We have found in locomotives broken in on this plant that while all bearings, excepting driving boxes, run perfectly smooth, the latter often do not, which is probably to be attributed to heat from the hubs, as the bearings which give trouble on the road ran as cool on the plant as the others.

The time required to adjust the plant for receiving an engine of different wheel base and cost of changing brake shoes (the only part of the plant requiring renewal) averages about as follows:

Changing plant when set for eight-wheel engine to another of different wheel base, one machinist and one helper	1½ to 1¾ hours.
Eight-wheel to ten-wheel engine, one machinist and one helper	2½ " 3 "
Ten-wheel to eight-wheel engine, one machinist and one helper	2 " 2½ "
Ten-wheel to ten-wheel of different wheel base, one machinist and one helper	2 " 2½ "
Placing engine on plant and making all connections, one machinist and one helper	1½ " 2 "
Taking engine off plant, one machinist and one helper	¾ " 1 "

The above includes connecting the feed water supply, the governor and Boyer speed recorder.

One set of shoes will break in from eight to ten engines, when one-third of the shoes will require renewal,

requiring the work of two men from four to six hours. After three or four engines are broken in the shoes require adjusting, which takes two men from 45 minutes to one hour. In testing engines the plant can be run from three to five hours daily for about two weeks before shoes must be renewed. From the above it is seen that it costs from $1.25 to $2 for putting an engine on the plant, adjusting and maintaining brakeshoes and removing the engine afterward.

The first work undertaken was an investigation of the effect upon the performance of C. & N. W. engine No. 19, a 17 × 24 in. engine, with 16 sq. ft. of grate surface and 975 sq. ft. of heating surface, of different amounts of inside clearance in the valve. Fifteen tests were made, at speeds between 25 and 45 miles per hour, and at about 6, 7, and 9 in. cut-off. The inside clearance varied in these tests from zero or line and line to $\frac{5}{8}$ inch clearance. Each test was run from 2½ to 3 hours, continuously, and at rates of combustion ranging from 62 to 135 lbs. of coal per square foot of grate per hour. Incidentally four different kinds of Illinois and Indiana coal were tested. The evaporation of the Indiana coal at rates of from 62 to 65 lbs. per square foot of grate per hour, from and at 212 deg., varied from 8.25 to 9 lbs. of water per pound of coal. Illinois coal varied from 7.5 to 8 lbs. with rates of combustion of from 68 to 90 lbs. per square foot of grate. At higher rates of combustion the efficiency of evaporation decreased quite rapidly, with a slightly inferior grade of Illinois coal being as low as 6 lbs. of water per pound of coal, when the rate of combustion was from 125 to 135 lbs. per square foot of grate per hour as shown in Fig. 1.

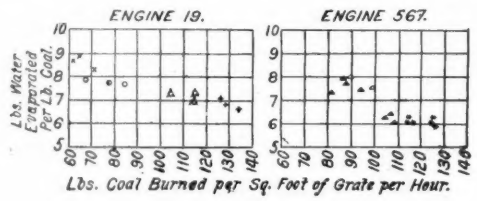


Fig. 1.

Fig. 2.

The coal per horse-power hour varied with the power developed, being least for low horse-power, about 250, and for instance it was greatest for powers above 450 H. P. The entire range lay between the extremes of 3.55 and 4.61 lbs. of coal per horse-power per hour. The highest power developed was 477 at 43 miles per hour and 7 in. cut-off. This was easily maintained for two and a half hours and was by no means the limit of the power of the engine. The effect of inside clearance upon the shape and area of the indicator cards at a speed of about 150 revolutions or 30 miles per hour is almost no variation in mean effective pressure with a gradual cutting out of the inside clearance of the valve from line and line to $\frac{5}{16}$ in. clearance on each side. What is lost by the earlier exhaust is gained by the later compression. The efficiency of the engine in water per horse-power per hour also shows very little, if any, loss, it being from 25.5 to 26.5 lbs. water per horse-power per hour.

These tests were supplemented by a series of 21 others with engine No. 567, another 17 × 24 in. engine, with a slightly larger grate, 17.5 sq. ft. and the same amount of heating surface as engine No. 19, viz., 975 sq. ft. They were undertaken with a somewhat wider range of speed, viz., from 16 to 46 miles per hour. They confirmed the results of the former series at the higher speeds, but at the lower speeds both the economy and power of the engine decreased when the valves were given inside clearance. Fig. 2 shows the performance in this series of tests.

Still another series of four tests were made on engine No. 797, a 19 × 24 in. 10-wheel engine. These tests, owing to some errors in observations, are unreliable as data on locomotive performance, but brought out very important point in locomotive design; namely the importance of stiff and rigid eccentric rods Engine No. 797 had long, crooked eccentric rods, such as are usually found on ten-wheel engines, and of about the ordinary stiffness. It was found, however, that these rods sprung so much and so irregularly as to make it almost impossible to obtain duplicate indicator cards with absolutely no change in conditions. A decided improvement has been made by making the rods "I" section and this is now being done on all engines passing through the shops for repairs.

As a result of these tests, checked by as careful comparative records of actual road performance as could be obtained, the following practice has been adopted on standard valves:

For through high speed passenger service	⅛ in. inside clearance
" local passenger service	3/32 " " "
" suburban passenger, freight and switching	0 " " "

The valves of the passenger engines have also longer outside laps than those of the freight and switch services.

The next work undertaken was a test of the effect of a smoke-burner on the boiler efficiency of engine No. 597. The tests showed that the prevention of smoke with steam jets in the firebox as arranged on this engine reduced the evaporation per pound of coal.

A feed-water heater was tested on this same engine, but no advantage in economy was found by its use in several careful tests. Some other design might show different results.

A special form of valve gear was next tested on an 18 × 24 in. engine No. 309. This gear had been in service until it had becomewhat worn, and the test was made to determine its efficiency in this condition and to decide whether it would pay to maintain it. Its performance was so satisfactory that it was refitted and returned to service.

Next in order came the elaborate series of tests made for the American Master Mechanics' Association's committee on exhaust pipes, stacks and nozzles. The complete report of these tests has been published in the proceedings of the Master Mechanics' Association for 1896, Vol. XXIX.

The effect of different amounts of lead on the economy and smoothness of operation was tested on engine No. 901, a 19×24 in. eight-wheel engine, carrying a steam pressure of 190 lbs. This engine has 20-in. ports and Allen valves, and it was found that improved results were obtained by reducing the lead from ¼ in. to $\frac{3}{32}$ in. at 6 in. point of cut-off, while no worse performance as far as power is concerned was shown with ⅛ in. lead at 6 in. cut-off with much smoother working. If the eccentrics are both set so as to give $\frac{3}{32}$ in. lead at 6 in. cut-off the full gear lead with the length of eccentric rod used is nearly $\frac{3}{32}$ in. negative. That is the valves at full stoke are blind by this amount. Careful tests indicate that the engine is more powerful in starting with valves blind to this extent, than with a lead at full stroke up to $\frac{1}{16}$ inch. It seems probable, however, that about $\frac{1}{16}$ in. negative lead at full stroke and $\frac{3}{32}$ in. positive lead at 6 in. cut-off is the best adjustment of the valves for fast passenger service with the valve gear as arranged on this engine.

Even with as stiff a valve gear as was used on engine 901, and it is above the average in this respect, the effect of deficient valve lubrication is very marked. Cards No. 9 and No. 10 were taken without changing anything about the engine except the lubrication of the valves, and they are by no means unusual examples. Without changing anything about the engine except the lubrication, the horse-power of the right cylinder was made to show the same as the other.

A rather complete set of thirteen efficiency tests were next made on two 15 × 24 in. engines, Nos. 940 and 941, having 61-in. driving wheels, 15.7 sq. ft. of grate area and 1,125 sq. ft. of heating surface. These engines are exactly alike in design and construction and yet one was reported and actually showed results on the performance sheet from month to month which were much inferior to those of the other. The tests were undertaken primarily to discover the defect in the inferior engine and remedy it. The indicator cards from these engines were as nearly identical as possible, and when both engines were tested under the same conditions, their efficiency was found to be the same. The "inferior" engine, however, could with difficulty be made to steam as freely as the other on account of slightly defective front end adjustments. This was remedied and on a test under service conditions on the road both engines did, as nearly as possible, identical work.

Incidentally while these tests were in progress the effect upon the evaporation efficiency of the boiler of varying the rate of combustion per square foot of grate was determined. In these tests no change whatever was made in the size of the grate, but the work done, and consequently the water evaporated, was gradually increased until rates of combustion varing from 90 lbs. of coal to 180 lbs. per square foot of grate area per hour were obtained in both engines, and as high as 219 lbs. per square foot of grate per hour in engine No. 940. These results are shown plotted in Fig. 3. They confirm as well as could be expected under the different conditions, the results obtained by Prof. W. F. M. Goss, and presented at the September, 1896 meeting of the New York Railroad Club. These curves show a rapid and fairly uniform decrease in efficiency as the rate of combustion is increased. The decrease appears to be not at as rapid a rate after that of 150 lbs. per square foot of grate is reached, but to establish the correctness of this indi-

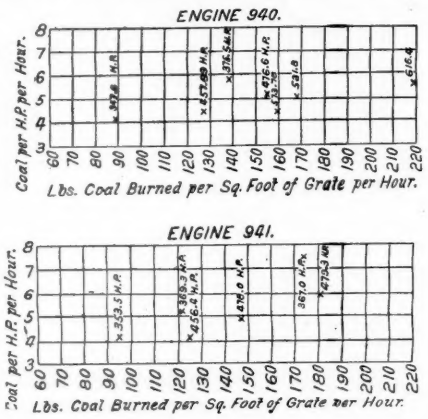
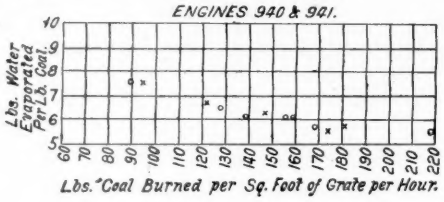

ENGINE 940.
Coal per H.P. per Hour.
Lbs. Coal Burned per Sq. Foot of Grate per Hour.
ENGINE 941.
Coal per H.P. per Hour.
Lbs. Coal Burned per Sq. Foot of Grate per Hour.

Fig. 3.

cation more data should be obtained. The results of the boiler evaporation at different rates of combustion are shown for engines 19 and 567 in Figs. 1 and 2. The results from both engines Nos. 19 and 567, Figs. 1 and 2, are not as accurate and reliable as those in Fig. 3, recording results obtained from engines Nos. 940 and 941. The error in the first tests was due to the water used being gaged in a tank of which the cross section was obtained by calculation. In the tests of engines Nos. 940 and 941 the exact weight of water was taken. The effect upon the total economy of the engine of different rates of combustion is shown by Figs. 4 and 5, giving the coal per horse-power per hour



Figs. 4 and 5.

at rates of combustion covered by these tests. The horse-power developed in each test is marked in figures on the diagram. Comparison of these results with those of the boiler performance Fig. 3 is interesting: The abnormally high points on the diagrams are due to a leaky condition of the firebox in those tests.

Analyses of the smokebox gases while these tests were in progress resulted as follows:

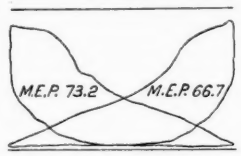
ENGINE NO 940.

Number of miles per hour.	Length of cut off, inches	Carbon Dioxide, per cent.	Oxygen, per cent.
25	4½	11.1	6.
35	4½	10.8	5.8
15	4½	10.06	8 0
25	7½	11.8	5.4
15	10	10.	7.4

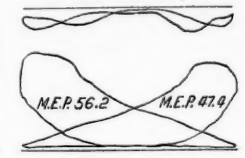
ENGINE NO. 941.

25	4½	9.03	9.43
35	4½	11.08	6.24
15	10	13.47	2.01

The series of tests above described on engines Nos. 940 and 941 were also utilized to give some data on the effect of long-pipe connections for indicators. This subject was exceedingly well presented by Professor Goss at the St. Louis meeting of the American Society of Mechanical Engineers in 1896, and his admirable paper on the subject is published in Volume 17 of the Proceedings of that society. It is almost impossible to take indicator cards from locomotive cylinders without the use of indicator pipes of considerable length, except on a testing plant. The writer confesses that the importance of this matter for lengths of pipe no longer than ordinarily used on locomotives, say 3 or 4 ft., was not realized by him until the cards shown herewith were taken, and he wishes to expressly state that all the data based on indicator cards contained in this paper are subject to correction due to pipes 3 ft. 8 in. long. Professor Goss has pointed out that it is practically impossible



CARD NO. 9.



CARD NO. 10.

Valves well lubricated.		Deficient lubrication.	
Left cylinder	6-in. cut off.	Right cylinder....	6-in. cut off.
Steam pressure.....	190.	Steam pressure.....	190
Rev. per minute.....	168.	Rev. per minute.....	168
Miles per hour.....	37.5	Miles per hour.....	37.5
Horse power.....	795.	Horse power	589.
	589.		

Difference in H. P..... 206.

Effect of deficient lubrication of valves, Class "A" Engine No. 901. C. & N.-W. Ry., Sept. 7, 1895.

to establish general corrections for long indicator pipes on account of the number of different conditions which modify their effect. It may be possible, however, to establish certain limits of error for known speeds and cut offs in locomotive cylinders and for the length of indicator pipes usually used which would meet all practical requirements. The cards No. 11 to No. 18 inclusive, were taken by the same indicator, arranged so that one card was taken through an indicator pipe 3 ft. 8 in. long, the other being taken from a pipe about 4 inches long. They were taken as nearly simultaneously as possible,

CARD 11.

Boiler press., 142.5; revolut's, 82.

Short pipes.	Long pipes.
M. E. P. 95.25	M. E. P. . 95.75
I. P...141.75	I. P...139.5
B. P... 11.50	B. P... 11 50

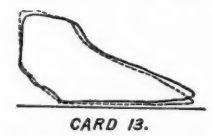
Increase, .52 p. c.

CARD 12.

Boiler press., 139; revolut's, 182.5.

Short pipes	Long pipes.
M. E. P... 68.5	M. E. P... 68 5
I. P...132.	I. P.. 128.
B. P... 9 5	B. P... 10.75

Increase, 0.

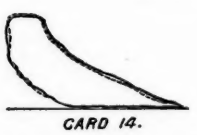


CARD 13.

Boiler press., 137.5; revolut's, 192.

Short pipes.	Long pipes.
M. E. P... 64 5	M. E. P... 49 0
I. P....132	I. P. ..126.
B. P... 11.0	B. P... 13.75

Decrease, 2.4 p. c.



CARD 14.

Boiler press., 140, revolut's, 133.5.

Short pipes.	Long pipes.
M. E. P... 48 25	M. E. P... 49.25
I. P....138.0	I. P.. 126.0
B. P. . 9.75	B. P... 10.5

Increase, 2 0 p. c.

only the time necessary to turn two cocks intervening. They show the effect of the pipe at various speeds and cut offs from 82 revolutions to 352 revolutions, and 6-in. and 9-in. cut off, always to be to increase the area of the card from ½ to 16.9 per cent.

A number of other special investigations were carried out, but most of them are of such a nature that a description in a brief resume such as this is impossible. These included an investigation of the effect on the performance of the engine of enlarging the cylinder clearance, results of improved sight feed lubricator attachments, and also special tests of several designs of slide valves, arranged to reduce compression and back pressure without at the same time releasing the steam prematurely. None of these valves proved satisfactory, principally on account of all having a greater or less number of moving parts.

An interesting series of tests of the tightness of cylinder packing rings was made on engine No. 567. The front steam port of one cylinder was plugged with a steam tight plug, the front cylinder head was removed and the engine was run at various speeds under full throttle with cast iron ring packing rings made with different joints, and also with the joint in different parts of the cylinder. The leakage was carefully observed for

CARD 15.

Boiler press., 141: revolut's, 188.5.

Short pipes.	Long pipes.
M. E. P... 44.0	M. E. P... 47 5
I. P...125.0	I. P. .122.0
B. P... 10.0	B. P... 11.0

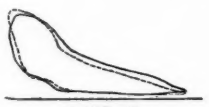
Increase, 8 p. c.

CARD 16.

Boiler press., 133; revolut's, 242.

Short pipes	Long pipes.
M. E. P... 39.5	M. E. P... 45.5
I. P...125.5	I. P...118 0
B. P. . 12.0	B. P... 10.0

Increase, 15.2 p. c.

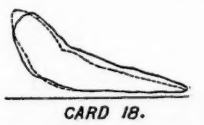


CARD 17.

Boiler press., 142.5; revolut's, 301.

Short pipes.	Long pipes
M. E. P.... 59 5	M. E. P. . 45.75
I. P....127	I. P...120.
B. P... 15.	B. P... 15 25

Increase, 15 8 p. c.



CARD 18.

Boiler press., 142; revolut's, 352.

Short pipes.	Long pipes
M. E. P. .38.5	M. E. P. . 45 0
I. P. ..127.	I. P. 121.
B. P... 17.	B. P. 15.5

Increase, 16.9 p. c.

M. E. P.—Mean effective pressure.
I. P.—Initial pressure.
B. P.—Average back pressure, including compression.
- - - - Short pipes.
—— Long pipes.

each condition and recorded. Briefly, the results indicated that the form of the joint was immaterial as long as it was kept near the bottom of the cylinder. The rings, when free, tend to rotate sometimes one way, sometimes another, until they find their best bearing, then they seem to remain stationary. When rings are worn to fit cylinder and joints at or near bottom there is no leak with either lap or open joint. New rings put in cylinders only slightly worn leak until they are worn to a

bearing. There was no more leakage at speed than when running slowly. The conclusions drawn from the test were that rings should not be free to turn and the joints should always be near the bottom and about 3 to 4 in. apart.

Tests of the efficiencies of two, two-cylinder and one four-cylinder compound engines, all of different design, are now in progress, but still uncompleted. Enough only is done to indicate that at the most efficient point of cut-off the compound will show considerable economy over the simple engine under similar conditions. These tests will include not only the efficiency of the engine and boiler when developing different power, but also when the cylinder ratio is varied.

One of the most valuable features of this plant is the governor, which automatically regulates the speed at which the engine to be tested runs. This regulation can be made regardless of the amount of power the engine is exerting and so close and accurate is it that in tests of continuous running for three hours it is entirely possible to not exceed an error of two per cent. This is an exceedingly valuable and really essential feature of the plant, as it enables a test run under certain conditions to be duplicated when necessary as far as speed is concerned.

The Trojan Platform and Buffer.

The Trojan Car Coupler Co. has lately introduced a new center stem platform which has some novel features and is positive in its action in keeping the faces of the buffers together on a tangent or a sharp curve. We show three views of it.

Fig. 1 is a front view, showing the face of the buffer, the Trojan coupler and the McKeen carrier iron to give it lateral play on curves. Fig. 2 is a plan of the buffer head in its uncoupled position, the threshold plate, the side pivoted buffers and the springs for operating them. The side buffers are of steel 2¼ in. in diameter, made so that the holes in the sills can be made round and thus not weaken it. The springs in the rear of the sills are simply retaining springs to hold the buffer in place when the cars are uncoupled. The collar next the spring is attached to the buffer stem, its smaller projection engaging the ⅝-inch. coil of the operating spring, so that in coupling the cars the inner coil only is compressed, after which on any further compression, as in stopping or in passing curves, the larger portion of the collar engages the larger ⅝ spring as well as the smaller ones, equalizing themselves.

The buffer stems have no cotters or nuts to prevent them from working out freely on sharp curves, and the double coil springs on the opposite side would bring the buffers back positively to their normal position parallel to the end of the car. There are no holes in the top of the buffer head; no counter sunk pivot pins to wear away the threshold plate or drop through. The pivot pins are inserted below the buffer plate, made of a good quality of steel and have square shoulders to prevent them from dropping through, and yet are flush with the top and bottom of the stem, so that the head can swing in close to the car on curves.

Fig 3 is a section through the center, showing the detached center stem similar to that of the Miller buffer. This is compressed 3½ inches when the cars are coupled, and pushes the follower shoe, which is tubular in form with the arm reacting up to and engaging the buffer stem. The double coil spring is inserted in this, and a stop to engage it is bolted fast to the drawbar. Then, when the cars are coupled, the projection in the front end compresses the inner coil, after which any further compression is transmitted as before to both springs, thus aiding the others in preventing jar.

When the drawbar pulls out by sudden jerks or in starting heavy trains, the stop on the rear of the spring forces them forward against the front of the shoe and thus keeps the faces of the buffers in positive contact.

It will be seen by the relative position of the coupler and the platform buffer that considerable compression is brought upon the drawbar spring before the buffer strikes the end sill of the platform.

Fig. 4 shows a platform truss, devised especially to sustain the additional weight of the continuous platforms and vestibules when applied to the Miller platform. By the attachment of the truss to the car end sill by bolt with square washers for stiffening the corners, the platform is greatly strengthened and prevented from sagging, and by the similar attachment to the platform-end sill, that timber is securely tied to the car body. This will make it unnecessary to make any changes in the framings of the Miller platform, and provide ample means for its support.

This platform has been recently put on the market, but has been thoroughly tried and has given good satisfaction.

The Trojan Coupler Co. has an equalizer platform also, which is projected from the drawbar by the same method as the center stem, but no equalizer can be made to bring the buffers positively parallel to the end of the car after passing a curve; consequently, the center stem is recommended, and also because it saves expense by its adaptability to the Miller platform so largely in use.

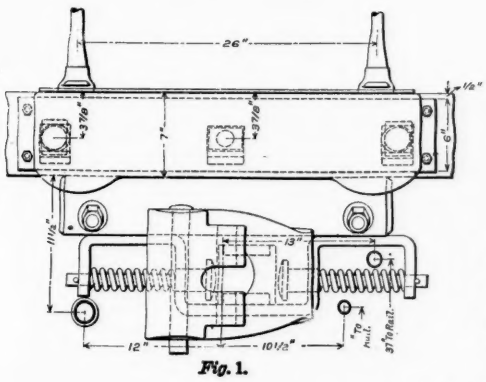


Fig. 1.

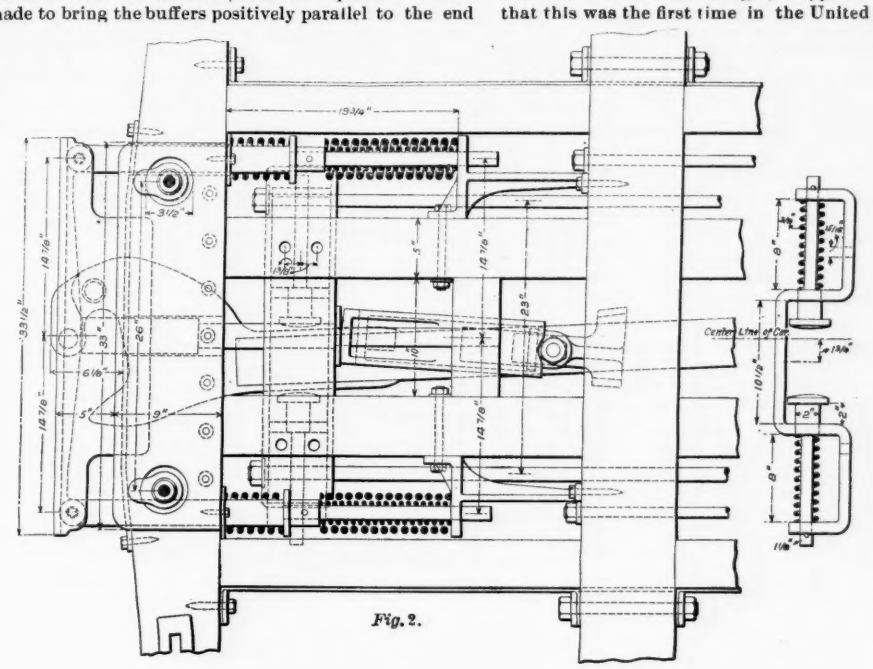


Fig. 2.

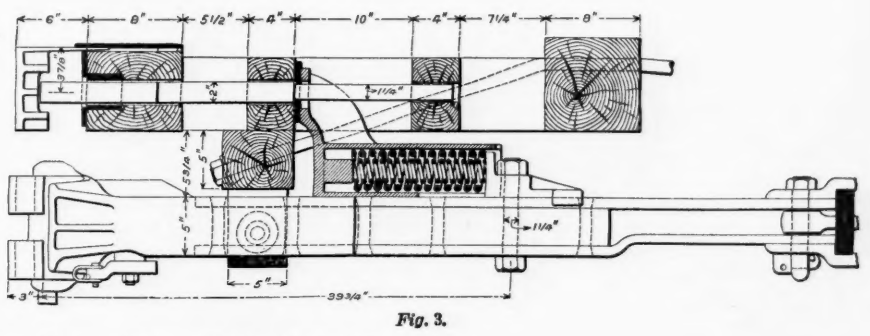


Fig. 3.

Plan, Elevation and Section of Trojan Platform and Buffer.

The Invention of Steel Skeleton Construction for Buildings.

Mr. F. T. Gates, President of the Bessemer Steamship Company, writes under date of Feb. 13, to Mr. W. L. B. Jenney, architect, Chicago, saying: "We shall take pleasure in naming a ship now being constructed for us by Messrs. F. W. Wheeler & Co., Detroit, Mich., the 'W. L. B. Jenney' as a mark of our appreciation of your distinguished services in connection with the invention and introduction of lofty steel skeleton construction of buildings." It may be worth while to put on record in these columns a few facts with regard to Mr. Jenney's part in developing the system of steel skeleton construction now quite commonly known as the Chicago construction. In the fall of 1883 Mr. Jenney was appointed architect for the Home Insurance Company of New York, and instructed to design a fireproof office building, to be built on the corner of Adams and La Salle streets, Chicago, and to be called the Home Insurance Building. He was instructed to give the maximum number of well-lighted, small offices; this would introduce very small piers, smaller than could be used in ordinary masonry construction. Architects had often built an iron column into a masonry pier, and Mr. Jenney had done the same thing in building iron columns into small piers in the street fronts of a building in Indianapolis some years before. Now he boldly departed from precedents and prepared designs for a building with a self-supporting, metal cage. The columns were of cast iron, as built-up columns were then too expensive. The beams were Bessemer steel from Carnegie, Phipps & Co., who said that this was the first time in the United States of the use of steel beams for this purpose. The question of expansion and contraction of a column 150 ft. high presented itself at once, and this Mr. Jenney solved by supporting the walls and floors of each story independently on the column, thus dividing the total movement into as many parts as there were stories.

This matter was the subject of considerable correspondence in the *Engineering Record* last summer, and Mr. George B. Post, of New York, pointed out that in 1881 he used cast-iron columns and wrought-iron girders in the design of the interior courtyard of the New York Produce Exchange. Mr. D. H. Burnham very justly pointed out that before metal-skeleton frames were designed, iron columns, encased in masonry, had been used, and that many cases of this kind of construction could be found, but "it would be improper for any one to claim, because he had used a steel column secured to girders and covered with masonry, that he had anticipated the metal skeleton frames. . . . The principle of carrying the entire structure on a carefully balanced and braced metal frame, protected from fire, is precisely what Mr. William L. B. Jenney worked out. No one anticipated him in it, and he deserves the entire credit belonging to the engineering feat which he was the first to accomplish."

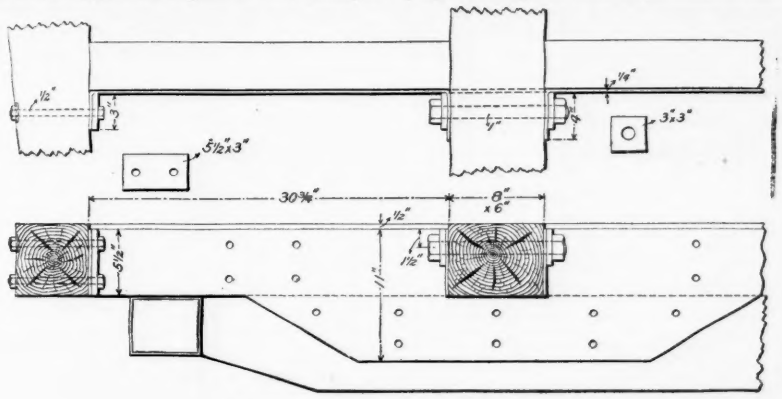


Fig 4.—Truss for Trojan Platform

The Webb & Thompson Train Staff.

The National Switch & Signal Co., Easton, Pa., has received an order from the Cincinnati, New Orleans & Texas Pacific to equip its line over the Ohio River Bridge at Cincinnati with the Webb & Thompson Electric Train Staff.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

It would be impossible to make any accurate statement of the prices at which rails have been selling from day to day since the dissolution of the Association, or of the quantities contracted for. A favorite estimate of the quantity is 600,000 tons, and the prices given run all the way from $14.50 up to $21. It is absolutely certain, however, that the tonnage contracted for since the break is enormous, and it is probable that it amounts to as much as two-thirds of the total output of the mills in 1896. The statements of the last 24 hours have indicated a stiffening of prices. Whether or not further orders are booked at the very low prices which have prevailed the last week, one thing is pretty certain, and that is, that the buyers will do well to employ the best inspecting ability and plenty of it. The orders will be rushed through at a great pace, and there will be great temptation and opportunity to turn out badly finished rails.

The January gross earnings of the railroads, as compiled by the *Chronicle*, still show losses. Out of 129 roads reporting 92 lose, the aggregate loss being 6.78 per cent., or over 2½ million dollars. The comparison is made with a month of increased earnings, the gain in January of 1896 having been 11 per cent. There was a contraction in the grain movement and in live-stock movement; the weather conditions were adverse and there was one less working day this year than last. The wheat receipts at the primary markets were little more than half as much as in January, 1896, and the corn receipts were 29,759,000 bushels against 37,258,000 the year before. The cotton movement, however, was heavier, the receipts at ports having been 583,231 bales against 494,091. The heaviest decrease shown by any individual road is that of the New York Central, namely, $338,023. The St. Paul, however, loses over $319,000 and the Northern Pacific $228,000. The Rock Island, the Canadian Pacific, the Wabash and the Illinois Central, each loses over $100,000. The losses are more general in the Northwest than in any other group, but in that group the gains last year were particularly heavy.

Although Russia is not classed as a fully civilized nation, it is developing sufficient mental vigor to wrestle successfully with its currency problem. Since 1857 its paper roubles, promises to pay 277 7/16 grains of silver, have not been redeemable, and their amount is somewhat more than 1,100 million roubles. Up to 1877 the effort of the government was devoted to securing the possibility of silver redemption. In 1887 the governmental programme was clearly defined to be an attempt to give the rouble a fixed value (in gold) at a figure approximating its average exchange value, and to resume specie payments on that basis. In pursuance of this, the Russian financiers arrived at the conclusion that this average exchange value was two-thirds of the full gold value. Therefore in the proposed resumption of specie payment, the 10-rouble gold piece, containing 179.1 grains, is to be stamped as 15 roubles, and the 5-rouble piece is to be stamped 7½ roubles. The new standard of value for the rouble is that of 11.94 grains of gold, the equivalent of 51.48 cents in this country. To ensure the proposed resumption, the Treasury has accumulated, and pledged for redemption, $385,000,000, gold, being nearly 70 per cent. of the present note circulation. It is notable that in this reorganization, the former arbitrary relation of 15½ to 1, between silver and gold currency, has been changed to 23¼ to 1, which may cause pain in a stout heart at Lincoln, Neb., but which, nevertheless, has an element in it of friendship for silver, for the market ratio continues to be somewhat more than 30 to 1.

A Possible Relation of the Technical School to the Engineering Association.

When it is considered that both the technical schools and the engineering associations have for a common object the education of men, who are either preparing themselves for engineering work or have already reached a position of prominence in the profession, it is interesting to note what relation the one bears to the other. In treating of the present or possible relations of the technical schools of this country to the engineering associations, the value of the work now done by each, and the particular field each occupies should first be considered.

At most of the larger institutions the course of study covers four years, the first two being devoted to subjects equally important to all branches of engineering, being in the nature of foundation work. During the third and fourth years the different courses of study diverge more widely and the student is especially trained in the theory and underlying principles of the particular branch selected. The final work of the student is the preparation of a thesis, he selecting the subject and collecting and arranging the data in the form of a report, and the preparation of this thesis is often the best work which the student does.

The work of the technical school might properly be divided into three classes—theoretical work, designing and experimental research. The strictly theoretical work taught by text-books, current literature and lectures covers ground which has been repeatedly gone over, and is much the same in all institutions. The writers of the standard works are men who have made a special study of, and are acknowledged authorities on, the subjects. The department of machine and structural design depends for its value wholly upon the instructor in charge, while work in the nature of experimental research is dependent upon two factors, the instructor and the equipment, which are so closely related that they cannot be considered separately. The strictly theoretical work is the foundation for both designing and original investigation, but among educators there will naturally arise much difference of opinion as to the relative value to the student of the work of the drawing-room and that of the laboratory.

To take a broader view of the duty of the technical school it should not only be a means for educating those who may be for the time within the institution, but also should further educate these same men, after leaving, and others, by continually furnishing them with reliable and exact data on subjects pertaining to their work. From this point of view the designs produced by technical students show in their true light. Made without regard to the cost to build or the economical placing of material, they are of no value to men in active life. Quite different is the case of data collected in the laboratories of prominent institutions and as used by engineers as a basis for estimates and calculations; much reliable information has been obtained from this source. A student is perhaps little benefited by making designs that could not be used in actual practice, and there is always danger in doing such work. We wish to point out that the work done by the technical schools which is of benefit to the greatest number has appeared in the form of theses, prepared under the direction of careful instructors.

The various associations of railroad men and engineers have for their objects the advancement of knowledge concerning the work in which they are particularly engaged, the exchange of ideas and the investigation of and reports on subjects of interest to all, enabling the Association to recommend what is found to be the best practice. Where subjects are important and their study involves such a large amount of work and expense, that no one railroad or person can afford to undertake it, the associations have carried on the work, the expense thus being shared and all receiving the benefits of the results. The associations have made progress in many directions, but it is regrettable that their reports are so often vague and so often convey little exact information. The men appointed to act as committees to carry on investigations are already loaded down with their own duties and responsibilities, and have little time to give to this work, which is too commonly put off until so near the date of the meeting that a report must be hastily prepared with the suggestion to carry the subject over until the next year.

We have on one side the men in active life, represented by the associations, who have not time to devote to this work, and on the other the technical schools with young men with from three to four years years' careful training, under the direction of competent instructors, who have both the time and inclination to investigate special subjects.

If the work now performed by committees could be done in conjunction with the technical schools more time and careful attention could be given to it, and exact data obtained and presented without fear of the criticism of a rival member. The work would stand or fall according to its merits, and the results would not be buoyed up by the names of a few prominent men. Further, the cost to the associations of carrying on experiments would be less. Probably the large as well as the small institutions would join in this work if they had an opportunity, and for the latter class it would be of great benefit. The schools and the associations are so closely related that the best results can be obtained by working together, and if proper encouragement and support be given, the technical schools would be able each year to furnish a large amount of exact information of great value to engineers.

Train Accidents in 1896.

The large table published herewith gives our usual tabular summary of train accidents in the United States as recorded in the monthly records published in the columns of the *Railroad Gazette*. The number of accidents is less than in 1895; the number of employees killed is not much larger, and probably the percentage of increase is not so large as the percentage of increase in train mileage; but the total number of fatal accidents to *passengers* is in discouraging contrast to that of 1895. That year showed the smallest record since 1881, and probably the smallest annual total for a period reaching far back of that; but a single bad train accident vitiates all averages, and in 1896 we have had two disasters of the worst kind, those at Logan, Ia., and Atlantic City, N. J., both in the same month. In September seven passengers were killed in a single accident at Arcata, Cal. This was on a railroad so insignificant that it hardly counts as a common carrier, yet it is one, nevertheless, on which passengers risk their lives. In October seven passengers were killed in a collision at Windsor Springs, Mo. In the matter of *injuries* to passengers we make no comparison, other than that which appears in the columns of figures, the number of persons reported injured in any accident being likely to vary according to the different standards of different reporters.

If we estimate the total passenger mileage in the United States for the year at 12,800 millions (for the year ending June 30, 1895, the government report gives the total as 12,188½ millions) it appears that 1 passenger was killed in 1896 for every 100 million miles traveled. In Great Britain, in 1895, the proportion, according to the best estimate we could make from the bluebook, was 1 passenger killed to 3,000 million miles traveled. Aside from the four cases mentioned there have been few accidents in the past year that have been at all uncommon in their causes or effects.

Table No. 1 is self-explanatory. As heretofore, the classification of causes lacks precision, especially in cases where negligence of trainmen and defects of cars or engines both contribute to an accident. Damage to cars due to the too sudden application of air-brakes has occurred frequently in 1896, as in previous years, but comparatively few of these collisions or derailments do sufficient damage to get into the newspapers.

The total number of casualties to persons recorded during the past six years is shown by years in the following table:

	1896.	1895.	1894.	1893.	1892.	1891.
Pass'rs killed	128	38	58	178	116	177
Emp. killed	318	302	280	424	490	550
Others killed	94	75	104	89	66	63
Total killed	540	415	442	691	672	790
Pass'rs injured	618	701	410	1,240	1,128	1,183
Emp. injured	601	739	845	1,243	1,205	1,447
Others injured	78	95	88	101	74	55
Total injured	1,297	1,535	1,343	2,584	2,407	2,685
Train mileage, millions*	....	834.2	818.4	889.4	864.9	831.2
No. persons killed per million train-miles	....	0.497	0.540	0.777	0.777	0.950

The relative frequency of the more prominent causes of collision for seven years past is shown in the following table:

	1896.	1895.	1894.	1893.	1892.	1891.	1890.
Train breaking in two	93	96	88	118	101	96	65
Misplaced switch	51	42	50	80	90	78	90
Failure to give or observe signals	33	64	54	108	140	153	82
Mistake in giving or understanding orders	48	35	31	67	78	88	73
Miscellaneous	99	117	166	240	201	259	243
Total explained	324	354	389	613	610	674	553
Unexplained	190	248	224	393	452	463	488
Total	514	602	613	996	1,062	1,137	1,041

* Train mileage is taken from Poor's Manual, which gives revenue mileage only.

It will be observed that in the number of collisions due to failure to give or observe signals there has been a marked falling off. While a record so incomplete as ours can hardly be taken as a safe basis for conclusions in a matter of this kind, this reduction of almost 50 per cent. certainly suggests that the adoption of the space-interval method of running trains has now become so general as to appreciably affect the accident record of the country as a whole. If that is not the explanation of the change, no explanation is apparent. At all events, the abolition of the old practice of depending on the flagman has produced a marked improvement on individual roads, and the number of roads now using the space-interval is considerable. But the number was not inconsiderable in 1895, and that year showed no improvement over 1894. The falling off in 1894 from 1893 was explainable, largely, by the great falling off in business, but the cause of the difference between the two comparisons since then is not so clear.

Although we make special inquiry of the officers of the roads involved, concerning most of the more serious accidents which appear in our record, the reader must bear in mind that a large proportion of the accounts given are made up from facts gathered in the daily newspapers published in different parts of the country.

As in 1894 and 1895, we have kept a memorandum of the number of accidents reported on street railroads, although these do not seem to be of such a character as to justify a tabular record like that of accidents on standard railroads. The number of street railroad accidents for three years, as noted in our monthly accounts, is shown in the table below. The gradual spread of electric roads during the past 10 years, and the accompanying increase of speed of street cars, has greatly increased the danger of street travel. So far as accidents are concerned the novelty of the matter has not yet worn off, so that in many cases, no doubt, a mishap is given more prominence by the reporters than it deserves. This makes the *number* of accidents reported large in proportion to the actual danger to life and limb.

STREET RAILROAD ACCIDENTS.

	1896.	1895.	1894.
Number of accidents	182	117	61
Number of persons killed	37	45	8
Number of persons injured	545	298	100

Most of these accidents occurred on electric lines, although we have taken cognizance of all lines where the speed is faster than that of horse-cars, thus including cable roads. The two most prominent electric road accidents in 1896 were those at Bedford, Ind., in which three persons were killed, and at Columbia, Pa., in August, killing 6 and injuring 50. The year before, 15 passengers were killed in a single street-car disaster, that at the drawbridge in Cleveland. On May 26, 1896, over 50 persons were killed in a street railroad disaster at Victoria, B. C., a bridge giving way under a heavily-loaded car. This, being outside the United States, is not included in the total given above.

TABLE NO. 1—TRAIN ACCIDENTS—THEIR NATURE AND CAUSES, FOR TWENTY-FOUR YEARS.

	1896.	1895.	1894.	1893.	1892.	1891.	1890.	1889.	1888.	1883-87. †	1878-82. †	1873-77. †
TRAIN MILEAGE in United States in millions of train-miles*	840.0	834.2	818.4	889.4	864.9	831.2	793.9	722.0	688.8	.....	.....	.....
COLLISIONS:												
Rear	228	301	280	455	485	555	495	379	404	342	275	150
Butting	129	109	134	223	251	284	323	260	311	174	121	96
Crossing and miscellaneous	157	192	199	318	326	298	223	110	89	32	21	44
Total collisions	514	602	613	996	1,062	1,137	1,041	749	804	548	417	295
DERAILMENTS:												
Broken rail	26	41	32	71	63	53	38	32	61	68	48	71
Loose or spread rail	16	16	35	57	53	68	44	28	42	66	34	31
Broken bridge or trestle	19	16	23	20	30	42	38	42	40	32	27	24
Broken or defective switch	9	9	16	41	26	38	33	10	29	13	3	9
Broken or defective frog	3	5	5	16	11	11	12	7	16	11	2	5
Other defects of road	5	8	3	9	8	2	2	1	1	1	2	9
Total defects of road	78	95	114	214	191	214	167	120	189	191	116	149
Broken wheel	42	33	33	48	46	39	37	28	48	33	28	22
Broken axle	74	70	71	88	56	66	59	48	44	49	36	32
Broken truck	24	20	18	31	28	38	25	20	27	15	11	10
Failure of coupling or drawbar	16	17	27	29	27	20	7	5	7	4	1	4
Fall of brakebeam	9	14	10	19	23	27	12	9	9	5	.....	3
Other defects of equipment	23	23	23	26	26	25	18	10	13	2	3	5
Total defects of equipment	188	177	182	241	206	215	158	120	148	108	79	76
Misplaced switch	28	48	53	67	98	78	54	54	70	69	77	76
Derailing switch	5	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Negligence of trackmen or bridgemen	2	8	6	14	5	16	8	10	3	5	5	9
Runaway engine or train	6	8	1	4	1	9	19	8	14	2	2	2
Open draw	2	3	4	4	3	3	5	1	4	4	3	4
Other neligence	23	17	39	48	57	38	22	19	26	5	4	6
Total negligence in operating	66	91	103	137	164	144	108	92	117	84	91	97
Animals on track	24	21	38	50	51	61	56	41	57	33	39	48
Snow or ice	9	16	12	16	7	6	6	5	22	17	13	20
Washout	23	17	5	16	19	19	18	20	19	21	21	28
Landslide	29	35	31	27	30	28	28	24	34	16	7	6
Accidental obstruction	26	23	19	32	29	20	28	8	20	32	32	38
Malicious obstruction	28	40	62	51	35	53	45	25	36	30	13	15
Other unforeseen obstructions	7	2	11	5	8	5	13	8	5	8	3	3
Total unforeseen obstructions	146	154	178	197	179	192	194	131	193	157	128	158
Others	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	5
Unexplained	314	293	296	423	425	439	377	296	385	184	231	224
Total derailments	792	810	873	1,212	1,165	1,204	1,004	759	1,032	723	646	709
ACCIDENTS WITHOUT COLLISION OR DERAILMENT:												
Boiler explosions	15	12	9	24	19	19	21	13	15	15	14	10
Broken parallel or connecting rod	6	10	12	8	10	8	9	5	22	22	14	10
Cars burned while running	4	17	16	18	13	19	15	4	7	10	8	9
Various breakages of rolling stock	12	8	10	18	20	28	27	21	22	21	9	16
Other causes	14	28	27	31	38	29	29	18	33	8	1	6
Total without collision or derailment	51	75	74	99	100	103	101	61	99	76	46	51

RECAPITULATION.

Collisions	514	602	613	996	1,062	1,137	1,041	749	804	548	417	295
Derailments	792	810	873	1,212	1,165	1,204	1,004	759	1,032	723	646	709
Other accidents	51	75	74	99	100	103	101	61	99	76	46	51
Total	1,357	1,487	1,560	2,307	2,327	2,444	2,146	1,569	1,935	1,347	1,109	1,055

* Train mileage is taken from Poor's Manual, which gives *revenue* mileage only; that for 1896 is estimated.
† Average per year, for five years.

Proposed Railroad Legislation.

The most notable legislative action, affecting railroads, which has been reported during the past week, aside from the action of Congress on the Anti-scalping bill, which is reported elsewhere, is that in Kansas, where the railroads, after assuring themselves that some sort of a reduction in rates would certainly be ordered by the legislature, secured time to consider a compromise, hoping to moderate the demands of the Populists. We note a few other bills, taking the states alphabetically.

In Arkansas there is a proposition to regulate sleeping-car rates, reducing them severely. The bill includes the usual clause about keeping the upper berth closed when not in use. In Idaho a sweeping measure to reduce rates is proposed. In Illinois the proposition to reduce passenger fares, on which the Railroad Commissioners refused to act, is being pressed in the legislature. In Missouri a bill has been *passed*, by one house, giving the Railroad Commissioners power to prescribe freight rates; a bill is proposed taxing sleeping cars and regulating sleeping-car fares. In New Jersey, there is a bill to change the method of taxing railroads, in accordance with the recommendation of the Special Commission, which was reported in the *Railroad Gazette*, of Feb. 12. There is also a bill to prevent railroads from interfering with passengers who wish to carry parcels in passenger cars. This bill is the outcome of the ridiculous action of suburban passengers on the Central of New Jersey, who have lately gone to the extent of using force in defense of illegitimate expressmen who insisted on carrying their bundles into the passenger cars.

In New York there is a proposition to authorize the Secretary of State to issue free railroad transportation to the Governor and members of the legislature. This is a renewal of last year's attempt to evade the plain provisions of the state constitution.

The North Carolina legislature, on the 12th instant, enacted what is known as the "fellow servants" law making railroad companies liable in damages for the killing or injuring of employees through the fault or negligence of "fellow servants" or other employees of the same company. The bill was passed unanimously, no a single vote being recorded against its passage, a fact due largely to the recent killing of two or three engineers by reason of the negligence of the engineers and conductors of other trains which caused the collision, and the published accounts of the inability of the widows and families of the deceased to recover damages on that account. The bill, besides giving railroad employees the right to sue, also prevents any waiver of that right by such employee, through means of a contract with the company at the time of his entering its service or otherwise.

The Legislature of Oklahoma has passed a resolution requesting the legislatures of Kansas, Nebraska and Texas to join the Territory in reducing freight rates. The South Carolina Legislature has *passed* a bill requiring separate cars for the white and black races, both first class and second class, but "through vestibuled trains" are excepted. In Tennessee there is a petition from the colored people protesting against the separate-car law of that state.

State Railroads in South America.

After much grumbling on the part of the public about bad service, the Brazilian government has finally determined to lease the Central Railroad, and with it all other government lines. This is a confession that the system of state-owned railroads has proved a failure, in Brazil at least, and the growing discontent in Chile will probably sooner or later result in turning its roads over to private management. The terms on which the Brazilian roads are to be leased are: A 60-years' duration of leases, an immediate payment of $25,000,000 to the state, and an annual rental to be determined by competitive bids. The profits above a certain rate per cent. are, furthermore, to revert to the government. The lessees will have absolute freedom in the control of the roads, and in the selection of their staff.*

Considering the uniform prosperity which all the roads (São Paulo, Sorocabaua, Mogyana, and others), through the coffee belt of Brazil have enjoyed

* See *Railroad Gazette*, Feb. 12, page 119.

TABLE NO. 2.—CASUALTIES TO PASSENGERS AND EMPLOYEES IN TRAIN ACCIDENTS IN 1896.

Tabulated according to classes of causes.

Month.	Defects of road.				Defects of equipment.				Negligence in operating.				Unforeseen obstructions and maliciousness.				Unexplained.				Total.			
	Pass.		Emp.		Pass.		Emp.		Pass.		Emp.		Pass.		Emp.		Pass.		Emp.		Pass.		Emp.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
January	1	2	3	1	0	7	8	4	0	33	17	45	0	2	8	11	0	0	4	7	1	44	40	68
February	0	8	0	3	0	9	6	0	0	23	17	37	0	9	7	9	0	0	5	5	0	49	35	54
March	0	6	0	5	0	0	4	1	0	33	12	30	0	3	1	7	0	1	1	6	0	43	18	49
April	1	20	11	13	0	0	1	2	1	3	6	22	3	21	3	6	1	3	1	6	6	47	22	49
May	0	0	1	4	0	0	3	5	0	5	7	19	3	8	4	6	3	12	2	5	6	25	17	39
June	0	0	0	1	0	0	2	1	3	13	12	18	0	5	0	10	0	0	0	7	3	18	14	37
July	0	15	3	2	0	3	5	7	75	104	7	18	0	25	7	2	0	0	1	4	75	147	23	33
August	0	0	0	2	0	4	3	0	0	45	21	44	0	4	11	4	1	15	4	3	1	68	39	53
September	9	76	1	3	0	9	3	4	0	19	16	44	0	2	2	4	0	0	8	15	9	106	30	70
October	0	2	3	1	0	0	4	3	9	21	17	40	0	0	0	4	0	3	3	7	9	26	27	55
November	0	5	0	5	0	0	1	6	1	0	7	22	0	5	2	6	0	1	0	2	1	11	10	41
December	0	10	0	2	0	0	8	8	0	11	15	10	17	13	14	15	0	0	6	18	17	34	43	53
Year	11	144	22	42	0	32	48	41	89	310	154	349	23	97	59	84	5	35	35	85	128	618	318	601
Year, 1895	2	106	16	69	4	52	30	73	17	378	157	415	6	43	46	100	9	122	53	82	38	701	302	739
Year, 1894	3	33	23	70	5	19	24	56	127	202	136	462	16	95	61	145	7	61	36	112	58	410	280	845
Year, 1893	15	336	32	121	3	64	47	75	52	634	243	742	1	56	156	167	7	150	46	138	178	1,240	424	1,243
Year, 1892	23	322	39	103	2	85	61	93	178	514	271	718	5	88	72	177	8	117	47	113	116	1,126	490	1,204
Year, 1891	24	291	45	101	7	90	42	65	114	458	345	939	23	116	57	154	9	228	61	188	177	1,183	550	1,447
Year, 1890	19	195	61	126	4	86	30	77	15	624	337	959	24	103	60	165	10	216	81	192	172	1,224	569	1,519
Year, 1889	16	167	30	81	7	58	24	63	46	291	189	595	34	107	53	120	5	122	40	119	108	745	336	978
Year, 1888	5	195	45	153	16	65	35	92	92	388	217	573	11	106	77	163	44	258	60	117	168	1,012	434	1,098

for years, the government will probably experience little difficulty in finding competent bidders. The Rothschilds are already in active correspondence by cable with the Brazilian Finance Minister, Dr. Bernardino de Campos, concerning this matter. Considering the close commercial relations of the United States with Brazil, and its enormous dealings in Brazilian coffee, and considering also that the Central Railroad was chiefly built by American engineers with our standard gage and equipment, it would be pleasing to see American capitalists enter this field, now that so favorable an opportunity presents itself. This road is best known to most Americans under its old name of the Dom Pedro Segundo Railroad.

These are Brazilian railroads. but a comparison of net earnings of the various Argentine railroads shows the disadvantage under which those lines work, which either belong to the state or have a close relation to the government. The National railroads show a profit in 1896 of $58,420 gold, equivalent to 0.13 per cent. on capital invested; the Provincial lines, $1,094,087, or 1.32 per cent. on capital invested; the guaranteed lines, $1,593,305, or 1.43 per cent. on capital, and the private lines, $9,802,630, or 4.28 per cent. on invested capital. The total lengths of track belonging to these lines respectively are: Under National control, 636 miles; under Provincial control, 1,818; belonging to guaranteed companies, 2,401 miles, and belonging to private companies, 3,897 miles. The respective costs per mile in gold of these lines were: For the National, $66,629; for the Provincial, $45,522; for the guaranteed, $46,387, and for the private lines, $58,855.

Annual Reports.

Chicago & Alton.—The annual report of the Chicago & Alton for the year ending Dec. 31, 1896, is received. The total miles of road operated were 843.35, which have remained the same since the road was extended to Kansas City in 1879. The miles of sidetrack are 230.74, or sufficient to lay one line of track on 27 per cent. of the total road. The main results of operation were:

	1896.	1895.
Gross earn.....	$6,840,281	$6,802,486
Working expen.....	4,038,547	3,982,993
Net earn.....	$2,801,737	$2,819,493

The working expenses were 59.04 per cent. of the gross earnings; the year before they were 58.55. The gross earnings increased 0.55 per cent., and the working expenses increased 1.04 per cent. The net earnings decreased 0.63 per cent. The increase was $49,000 in freight and $10,000 in mail. There was a decrease of $18,000 in passenger traffic. These changes amount to little in percentage, except in the mail receipts, which increased 5.18 per cent. The passenger earnings were about 31 per cent. of all and the freight earnings 63.4 per cent. The earnings from mails were only about 3 per cent. of the total. The gross earnings per mile of road worked were $8,111; the year before they were $8,066. The net earnings per mile were $3,322 and the year before $3,343.

The passenger-miles were 104,642,000, being 5,805,000 less than in the preceding year. The rate per mile was .022 cents; the year before it was 1.932 cents. This slight increase in the passenger rate was coincident with a small increase in the number of passengers carried, a rather important increase in the number of passenger-miles and an increase in the percentage of through passengers. In 1895 the through passengers were nearly five per cent. of the total, and in 1896 they were 5.8 per cent. The ton-miles in 1896 were 531,022,122, an increase of 36,107,852. The ton-mile rate fell from 0.867 cent in 1895 to 0.817 cent in 1896. The total tons carried increased very slightly; that is, 2,410 tons, and obviously the average haul was longer. The through freight in 1895 was 18.1 per cent. of all, and in 1896 it was 16.9 per cent. The estimated cost of carrying one ton a mile was 0.436 cent; the preceding year it was 0.461. The freight train-mile earnings were not quite so good in 1896 as in either of the two years preceding; that is, they were $1.375, and in 1895 they were $1.474.

Out of net earnings, dividends were paid to the amount of $1,778,448 on the capital stock of $22,230,963; that is, at the rate of 8 per cent. The Alton has long had the enviable peculiarity of being one of the very few roads with diminishing fixed charges and with but very slightly increasing capital stock, which peculiarity is, of course, largely due to the sagacity of the management in refraining from making unprofitable extensions. President Blackstone, however, points out in the annual report the ever-increasing burden of taxation. In 1880 the taxes paid amounted to 4.24 per cent. on the net earnings. This rate has crept up year by year with hardly an interruption until it was in 1893 9.1 per cent., in 1895 it was 10.17 per cent. and in 1896 it was 11.26 per cent. This has happened, notwithstanding the fact that the number of miles of road on which the company pays taxes has remained unchanged for the last 17 years, and notwithstanding the other fact that the net earnings have decreased from $3,477,985 in 1880 to $2,801,737 in 1896.

The President mentions the fact that since September, 1895, daily trains have been run by the company between Chicago and Peoria. These have run over the Alton lines from Chicago to Washington, 143 miles, and over the Toledo, Peoria & Western between Washington and Peoria, 12 miles. Considerable traffic has been developed by these trains, but by reason of the very low rates which have long prevailed the margin of profit on this traffic is very small. It is hoped that with more favorable terms for the use of the tracks and terminal facilities on the Peoria, the company's interest will be served by continuing this traffic to and from Peoria, which so far has been considered somewhat experimental.

In condemning the practice of the Chicago Great Western in buying corn for the sole purpose of getting the transportation of the purchase from Kansas City to Chicago, the Interstate Commerce Commission takes care to distinguish between that case and the cases of the anthracite coal companies, which carry coal dug from their own mines, and are able to practically discriminate against other shippers, in carrying charges, by varying the selling price of the coal. The decision in the corn case, reported in our last issue, was written by the new Commissioner, Mr. Prouty. He says:

In thus holding, we are not unmindful of what the Commission has said in Haddock v. D., L. & W., 4 I. C. C. Rep. 296, 3 Inters. Com. Rep. 302, and Coxe Bros. & Co. v. Lehigh Valley, 4 I. C. C. Rep. 535, 3 Inters. Com. Rep. 460. Those cases are in no respect similar to this. In both the common carrier was also the owner of extensive coal fields, and indeed it had become a common carrier largely for the purpose of transporting the product of those mines to market. This state of things existed before the passage of the Act, and had no reference to the Act. Unless the carrier was permitted to transport its coal, the result would be in effect the confiscation of its property, and to order it to charge itself with a particular rate would merely result in a matter of bookkeeping. Under these circumstances it was held that the only remedy was to inquire whether the rate charged the complainant was a reasonable one. In the case under consideration the grain was not property which the carrier had purchased for use in or about its business or with a view to its ownership, but was property which it had bought for the express purpose of securing the right to transport it, and thus evade the law which would have applied to its transportation had it been owned by any other party. In those cases there was a permanent condition which must be met; in this a temporary unlawful practice which should be stopped. We believe that the powers of the Commission are adequate to that end and that they should be exercised.

The "Iowa Development Company" scheme was as simple as A B C. The president of the road got a Chicago firm to buy grain in Kansas City and pay the profit, less the usual commission, to the Iowa Development Co. *without deducting the cost of the freight.* In fact the freight bills never bothered the consignee at all, for he paid them by a draft on the Development Company. The road could not collect these drafts in full, because the Development Company had not enough money. In three months the deficit was $15,000, making the actual earnings of the railroad on the corn about 10⅞ cents per 100 lbs., whereas the published rate was from 11 to 18 cents, varying several times during this period. In the three months (April, May and June), the Chicago Great Western carried 70 per cent. of all the corn that was moved from Kansas City to Chicago.

Mr. M. H. Smith, President of the Louisville & Nashville, has recently published a letter in the Louisville *Courier-Journal*, in which he presents very forcibly some of the reasons why the anti-scalping bill should be passed. He says that the ticket scalpers are to-day "the most unscrupulous and thoroughly organized association for the commission of unpunished crime that has ever existed in this or any other country." He calls especial attention to that phase of public opinion which shows such indifference when "wrongs are inflicted by individuals, communities and governments upon corporations, and especially railroad corporations. The moral sense of the public has been, or is rapidly becoming blunted in matters affecting railroad corporations." This perversion of the moral sense, he says, permeates the entire body politic. Some of our readers will remember that we have often called attention to this singular fact, which is one of the most important reasons why crimes can be committed against railroads, not only under the cover of the law, but by people who are known to be criminals or semi-criminals, while the local authorities sit idly by. A great deal of the train robbing and the train wrecking and of the numerous depredations of tramps comes from this fact—that so many respectable people have come to look upon railroad corporations as lawful prey. We lately heard an eminent lawyer say that in a free country the rights of the rich must be protected as well as those of the poor. We might add that no country can be free and civilized unless the rights of the corporations are as safe as those of an individual.

It appears that the proposed Federal law to make ticket brokerage illegal has not been given up, and the Senate Committee made a favorable report upon it this week, having introduced two amendments. The bill as amended makes it unlawful for any one to sell railroad tickets except persons authorized by proper certificate to do so. A single exception permits the purchaser of a ticket in good faith, for personal use, to sell the ticket. Another amendment requires the railroad companies to redeem a whole ticket if the purchaser is unable to use it. Another provision requires all roads to redeem every legal ticket outstanding within 30 days after the passage of the act. The forgery of railroad tickets is made a felony punishable by a fine of not more than $3,000 for each offense and imprisonment for not more than two years. Both the railroad officers of the country and the scalpers seem to have been making unusual efforts to arouse public sentiment on this subject and numerous memorials, both for and against the bill, have been sent to Congress. The most noticeable action on the side of the scalpers is a resolution of the Lower House of the Michigan Legislature. Governor Pingree, of that state, says that any legislation restricting the rights of the people to do what they please with tickets is "un-American." The Merchants' Exchange of Memphis, after considerable discussion, took no action, the scalpers evidently having had influence in the meeting. On the other hand, the Board of Trade of Louisville endorsed the proposed law. Mr. Milton H. Smith, a resident of that city, President of the Louisville & Nashville Railroad, published a letter on the subject denouncing the scalpers in the most vigorous language, as noted in a preceding paragraph.

In the discussion on the inspection of rolling stock at the January meeting of the Western Railway Club, the statement was made that "a first-class inspector commands a salary of from $1,500 to $2,500 a year." As suggested in our editorial of Jan. 29, inspectors who receive salaries within these limits are the exceptions, and if the amount paid be made the sole test it would follow that most inspectors are incompetent professionally, or unfit morally. The men who actualy do the work are seldom paid more than $75 a month, and the average would fall below this figure. Fortunately there are a good many honest and able young men willing to work for small pay while learning their profession. The truth is that inspection and testing have come to be a good deal affected by commercial considerations; competetion has entered and cut prices too low, and cheap men—cheap because they lack knowledge or character or experience—are often employed to conduct work which calls for the careful attention of competent engineers. For this the buyers of material are mostly to blame as competent inspection can be had; it is merely a question of price. Mr. McMynn's statement may be true when taken literally, yet there are so many who are considered good inspectors, both by themselves and others, and who command but small salaries, that we would rather say that a first-class inspector *should* command from $1,500 to $2,500 a year, but only a very few inspectors actually receive so much.

In speaking a week or two ago of the passenger-car gates in use on the Chicago & Alton and on the Southern Pacific in Texas, and of the complaints of passengers that while waiting to be admitted to cars they sometimes have to stand in the rain, we suggested an easy way to obviate this difficulty; and we have since seen, by a letter from a Southern Pacific official in the Houston *Post*, that on that road this is just what has been done Station Agents are instructed to have passengers remain in the waiting rooms until arriving passengers have all got out of the cars; and, moreover, in rainy weather the gate rules are entirely suspended. The letter gives stations and dates where this was done, and goes on to point out that nearly every day the gatemen prevent passengers from getting on to the wrong train. On Jan. 27, when the regulations were suspended throughout the entire line of the Southern Pacific on account of the extreme cold weather, there were three cases of passengers taking the wrong train and being carried in the opposite direction from that in which they had intended to go. Where there are large numbers of passengers to enter a train they are admitted at three separate openings. Passengers' friends are allowed to accompany them into cars to carry hand baggage, whenever it will not interfere with the comfort of other passengers.

On Feb. 15 and 16 the Burlington road ran a special train from Chicago to Denver, 1,026 miles, in 18 hours 52 minutes, equal to 54.06 miles an hour. The train, presumably a light one, was run for Mr. Henry J. Mayham, whose son was dangerously ill at Denver, and, indeed, died about four hours before the train arrived. From Akron, Col., to Denver, 118 miles, upgrade much of the way, the time was 124 minutes, equal to 57.1 miles an hour. The train left Chicago at 10 a. m. on Monday. This is the fastest time ever made for so long a distance. In 1893 the Exposition Flyer of the New York Central and the Lake Shore, a regular train, and a heavy one, traveled 964 miles in less than 20 hours, the average speed being 48.2 miles an hour. This train made 10 regular stops. The fast run of the Lake Shore from Chicago to Buffalo, Oct. 24, 1895, was over a distance of 510.1 miles, and the rate, including stops, was 63.61 miles an hour. Passengers on this train continued their journey to New York by the Empire State Express, making 952 miles at the rate of 54.2 miles an hour. This trip is the most nearly comparable to the Chicago-Denver trip, now reported, of any that we have record of; the rate is a trifle slower than that of the Burlington train, but there was a stop of half an hour or more at Buffalo.

Poor old crazy Morgan has withdrawn the Nicaragua Canal bill. He says there has been intervention in the affairs of the canal, not by the British government in name, but by British subjects who are doubtless emissaries and are "operating all the time to prevent us consummating this great duty to our own people" He threatens to reveal in executive session the sources of his information. It is a great pity that he cannot let the world know of the nefarious things that are going on. He gives notice that "at the earliest possible day in the extraordinary session to be called," he will introduce the bill again and do what he can to have it enacted into law. He warns Mr. Sherman that "if he blinds his eyes to the truth and takes the anodyne of flattery now fed to him like spoon food from Great Britain, he will find that the people of the United States will not sustain his demonstration." Senator Morgan is

undoubtedly demented, but there is evidence that the people of Alabama are finding him out and that he is digging his own political grave. It does seem a pity, however, that the Senate should be condemned to listen to his rubbish.

NEW PUBLICATIONS.

State Railroad Control, with a History of its Development in Iowa. By Frank H. Dixon, Ph D., Assistant in Political Economy, University of Michigan; with an introduction by Henry C. Adams, Ph. D., Professor of Political Economy and Finance, University of Michigan. New York: Thomas Y. Crowell & Co. 1896. Small octavo; 252 pages, with map and appendices. Price, $1.75.

Dr. Dixon's little book may be considered in the light of the information collected and of the opinion expressed and the value of the information is quite out of proportion to the value of the opinion. It is a capital compilation of the history of the Iowa Commission, the facts collected being sufficient for most persons who have occasion to look into such matters and being briefly and clearly stated. It goes without saying that such a history is illustrative of some very important phases of railroad development in the United States in the last 20 years.

The movement for state regulation in Iowa became serious in 1874, when the Grangers demanded that corporations be controlled and that the legislature should fix maximum railroad rates, leaving the railroads free to compete below those rates. In that year a maximum rate law was passed. Under this act a schedule of freight rates was prepared, together with a classification. There was also a provision against discrimination as between persons. Dr. Dixon says that the railroads assumed toward this act an attitude of utter indifference or of open hostility, which is probably in the main true, for in those days the prevailing notions among railroad men as to the proper relations between railroads and their governments and society at large, were very crude. Judicial interpretation of the act became necessary, and the outcome "was that famous series of decisions by which it was settled that the state had a right to establish limitations upon the power of railroad companies to fix the price at which they could carry passengers and freight."

This law was repealed in 1878 and there was a wide difference of opinion as to why it was repealed. The Grangers thought that the corporations misrepresented the workings of the law and tried to make it odious. Commissioner Dey thought that the impression was that the law was too rigid and prevented the satisfactory conduct of the railroad business. At any rate, with the repeal of the law came a great revival in railroad building in the state.

In March, 1878, a law was approved establishing a Board of Railroad Commissioners, with merely advisory powers and with no authority to enforce its decrees. The determination of rates was left entirely to the companies. The law forbade unjust discrimination, but permitted just discrimination, and it is interesting to note here the liberal view of the Iowa Commissioners in those days on this matter of discrimination. They held that discriminating rates should be made at competing points. This was the railroads only means of securing business at such points. If there was any profit on competing business, the non-competing points would get the benefit by lower rates. If the railroads were obliged to carry all the business at the competing rates, they would be compelled to abandon this competitive business entirely. The Commissioners were strongly impressed with the importance of building up business centers for jobbing trade and manufacturing within the state. On the same grounds the Commission abandoned the theory that states should prohibit higher rates for shorter than for longer distances. The Commissioners held that it was not their duty to interfere to destroy business that had been helped by a railroad company for the purpose of adding that business to another locality. They said also that a pro rata distance rate would destroy shipment out of the state of pretty nearly all forms of agricultural products; "it would be fatal to almost every Iowa interest." Acting under such theories, the Commissioners naturally sustained the railroads in various complaints brought against them for discrimination in rates.

The Commissioners early took a stand on the wholesale principle and on the question of carload rates, which was in harmony with their notion of building up the wholesale centers in the states and of encouraging manufacturing. They held that it was to such special rates that Iowa owed the growth of its jobbing trade and they refused to recommend a discontinuance of the jobbers' rates, although they were satisfied that the railroads would be only too willing to comply. The Chicago jobbers, interested in getting Iowa trade, joined with Iowa retailers and others, and finally the railroads abolished the jobber's rates. The Board declared that this had been brought about "by unwise and thoughtless clamorings."

Then the jobbers of Chicago and St. Louis undertook to secure the abolition of carload rates, but the jobbers of Iowa petitioned the board to help to prevent this change. This chapter is very interesting, as showing how, after all, the whole question comes down to a simple struggle between different interests.

This early Commission also took a liberal view with regard to pooling and held that a dissolution of the pool was disastrous to Iowa's interests.

The Commissioners expressed themselves in their reports as gratified with the outcome of the Commission experiment; they were satisfied with relying for the enforcement of decrees upon the strength of public opinion, and they believed that the Board possessed all necessary power. There was, however, bitter opposition to the weak form of commission and this opposition found a powerful leader in Governor Larrabee.

Dr. Dixon thinks that the most important result of the Commissioners' work is to be found in comparing the attitude of the people toward the railroads in 1887 and 1874. He thinks he discovers a gratifying conservatism and a growth of intelligence. The people had become more tolerant and more temperate. The Commission had performed a great service in removing, to a considerable extent, the mutual distrust between the companies and the people. But he holds that this Commission failed to check discrimination. Much of the discrimination, it is true, involved interstate commerce, over which the Commission was powerless, but it was believed that this form of evil could be remedied by giving more authority to the board.

A bill creating a strong commission became a law April 5, 1888. This provided that all charges must be reasonable and just, prohibited unreasonable charges, prohibited rebates and drawbacks, but did not prohibit carload lot rates. It declared preference to persons or localities unlawful; it provided for the free interchange of cars, as well as of traffic, and declared unlawful the higher charge for the shorter haul, and prohibited pooling. The Board was empowered to inquire into the management of the business of all common carriers, and had power to compel testimony and the production of books and papers. It was directed to make a schedule of maximum rates which should be *prima facie* evidence in court that the rates were reasonable. The manner of choosing the Commissioners was changed from appointment by the government to election by the people.

The Commission proceeded to fix a schedule of maximum rates and a classification. In June, 1888, suit was brought to restrain the Commissioners from putting their schedule into effect. And temporary injunctions were granted on the ground that the rates fixed by the Commissioners might not give a return on the capital invested. Complaints were made before the Commissioners of unreasonable rates and of discrimination, which were sustained. New schedules of maximum charges for local business were prepared by the Board by a change of classification. These were thus taken out from under the operations of the temporary injunctions, and the railroads soon accepted the Commissioners' schedule.

Dr. Dixon concludes that the benefits of stable rates have been largely realized by Iowa, and that complaints of discrimination have come to occupy but little of the time of the Commissioners. He claims that the railroads have done a larger business and got larger revenue as a result of the Commission rates, and that under them Iowa has found a great development of home industry—new mines, mills and factories have been opened, and the jobbing business has greatly increased. On the other hand, the opponents of the existing system claim that the falling off in railroad building is due to unremunerative rates. Dr. Dixon concludes that this is because the demand for railroad facilities has fallen off.

In general, he says, it would be premature to conclude that the universal adoption of the policy of a strong commission would be a great step in the solution of the railroad question. This depends on the character of the state's population and upon other things. He thinks that experience has proved that election of commissioners by popular vote is dangerous and that the method of appointment by the Governor with consent of the Senate, or the Executive Council, should be restored. He does not think that a multiplication of state commissions is to be the ultimate solution of the railroad question. For adequate control we must look to Congress and the solution of the entire question must come through a combination of national and state control. The state Commissioners should have advisory powers with authority to certify to the courts refusals to obey their recommendations; they should be in no sense courts To the National Commission should be given full and complete power of prescribing a general classification and a schedule of maximum rates for interstate business. "If we read the signs of the times aright, some form of control stronger than that now exercised, is inevitable."

On the whole, Dr. Dixon's book is, as we said at the outset, a very interesting compilation of facts, and indeed we have given but an inadequate idea of its value in this way. His opinions are moderate and reasonable and worth consideration.

We regret that we cannot speak so well of the introduction by Professor Adams. He holds that a return to the theory of private control is impossible. The evils of private management are too great, and have been made too manifest to warrant a moment's consideration of a return to the theory of exclusive private control. There are two possible lines of development. To increase the powers conferred on commissions or to have government ownership and management; he sees no other solution. But, as a student of social science, he is much opposed to state ownership, and this, for the very excellent reason that it would give to the central government entirely too much power.

We suggest that his conclusion that there is no alternative, other than state ownership or increased powers of control by commissions, is little more than a pure assumption. There are many other possibilities; for instance, many men see in the tendency to consolidation a suggestion of one way in which matters are to be improved in the future. Many men also, whose opinions are entitled to the greatest weight, are very much encouraged by the results of the work of the Joint Traffic Association.

One very important factor which the advocates of state control generally ignore is the progressive education of railroad officers, and by railroad officers we mean all railroad officers, directors as well as division superintendents. As we have often said, the best work that the commissions have done so far has been indirect, and that is, the work of education of railroad officers and of the public, through discussion, through commission investigation and findings and through court decisions. And we are still firmly of the opinion that those who are proceeding on the theory that the railroads can be profitably controlled by any special laws or any sort of government commission, are working on a false conception of the line of development of our social and political institutions, which line is bound to lead more or less directly, and more or less rapidly, to the greatest liberty of every man and combination of men, to work for their own interests, controlled only by a more accurate idea of what is for their best interests and by enlightened public opinion and by the common law.

To assume that the facts presented in Mr. Dixon's book prove or make probable that the railroads can be profitably controlled by the state, is about as remarkable an example of heroic generalization from inadequate facts as we have seen for a long time. Our own conclusion, from a careful reading of this book, is that the facts that are collected tend to show the futility of all attempts at strict control.

Books on Steam Navigation, etc.—We have had occasion several times to mention the catalogues of books on railroads, and especially of rare books, pamphlets and maps collected for sale by Mr. Edward Baker, 14 John Bright St., Birmingham, England. Mr. Baker now sends us a catalogue entitled "A Chronicle of Books Relating to Steam Navigation, the Navy and Allied Subjects, with their selling Prices." This is a pamphlet of 40 pages, the price of which is 6d. It contains titles of books and pamphlets on the history of the navy, ship building, navigation, history of the steamboat, history of the marine engine and many other subjects. The oldest of these publications is a folio pamphlet of 36 pages published in 1681, entitled "The Triumphs of Justice." This recites various public complaints against the administration of justice in the days of the Stuarts including one against ship money. Another old pamphlet is "Curiosities of Naval Law," published in 1722. Another interesting title is "The Lives of the Admirals," published in 1758, in four volumes, with maps and portraits. This division of the catalogue, bearing especially on the navy, fills 10 pages. In the division of ship building the oldest title mentioned is 1765, being "Murray on Ship Building and Navigation." The division on the history of the steam engine begins with Partington's "History," published in 1822. This is followed by Stewart, Galloway, Tredgold, Lardner and others, coming down to our own time. The student and the collector will find a great many attractive notes in the catalogue.

Two-Cent Railroad Fares. By Henry Apthorp, Ex-State Railroad Commissioner, Cleveland, O.

Mr. Apthorp has issued a revised and large edition of his little pamphlet on this subject, which first came out in 1892. He presents a careful argument showing the intricacy of the questions of fares, cost of service, etc., and shows how short-sighted are the usual political arguments in favor of reductions.

TRADE CATALOGUES.

Gear Cutter Grinders.—Gould & Eberhardt, of Newark, N. J., have sent us a small catalogue, in which are described and illustrated the parts that make up the grinders, such as we illustrated in the *Railroad Gazette* of Feb. 5, page 94. The complete 1897 catalogue will be sent by the company on application.

Delta Metal.—The Phosphor-Bronze Smelting Co., Limited, of Philadelphia, has issued a small pamphlet dated 1897, descriptive of the Delta metal castings, stampings and forgings made by that company. An engraving shows the Delta bronze propellers of the Russian Imperial Standart.

The Gates Iron Works, Chicago, Ill., has sent us a second edition of its catalogue of Tremain steam stamp mills. This mill has been designed especially to meet the demands of parties owning mining propositions in the first stages of development, and who wish to establish a crushing and amalgamating plant of moderate capacity in a short time, and with the least material. The mill is thus made with the view of securing great portability. So also are the boilers for use with it. Those ordinarily specified are of the semi-portable locomotive type on skids, but besides these a Harrison portable safety boiler can be had. These boilers are made sectional for mule back transportation, and require no riveting in their erection. Ordinary tubular boilers are also made in sections for building on arrival at destination. The catalogue is illustrated and priced, and contains instructions for erecting and operating the stamp mill and other information.

TECHNICAL.

Manufacturing and Business.

Albert Lucius, well known as a bridge and railroad civil and mechanical engineer, has removed his office from 73 Broadway to 38 Park Row, New York City.

The Berlin Iron Bridge Co., of East Berlin, Conn., has the contract for the steel work for the Catholic Protectory at Van Nest, N. Y.

F. S. Wonham, for five years Secretary of the Steel Rail Supply Co., of New York City, has accepted the Eastern agency for the H. K. Porter Mfg. Co., of Pittsburgh, with office at 122 Liberty street, New York. Mr. Wonham will make a specialty of working up export trade.

The Cumberland Valley Traction Co. will probably shortly be in the market for rails for its extension from Boiling Springs to Mount Holly, Pa., five miles. We are informed that the ties, poles and overhead construction materials for this extension have just been ordered. The headquarters of the road are at Carlisle, Pa.

The Pennsylvania Bolt & Nut Works is building an addition to its plant at Lebanon, Pa., 30 ft. × 70 ft., with an L of almost equal size. The washer department will be removed to this annex when completed.

A. M. Crane, formerly Assistant General Sales Agent of the Illinois Steel Co., with office in The Rookery, Chicago, has been appointed General Sales Agent, succeeding Julian L. Yale, resigned.

The annual meeting of the Vulcan Iron Works Co., of Toledo, O., was held last week and the following were elected: President, Alexander Backus; Vice-President, M. I. Wilcox, and John Smith, Secretary and Treasurer. Those named, with L. S. Sullivan and Merwin Jackson, constitute the Board of Directors.

The Selden automatic link and pin coupler is being applied to 100 coal cars of the Union Pacific, Denver & Gulf Railroad, which are booked for delivery this month. The coupler is the invention of S. Selden, of Aspen, Col., and is manufactured by the Selden Automatic Car Coupler Co., 319 Cheesman Block, Denver, Col. This coupler has been in service on the Union Pacific, Denver & Gulf for several months, and we are informed by an officer of the company that it has given satisfactory service.

The Joseph Dixon Crucible Co., of Jersey City, N. J., well known as a manufacturer of graphite materials, has established a railroad department in order to give more attention to that work, which has been constantly growing for some time past. E. H. B. Twining, who has a large acquaintance among railroad mechanical officers, has been appointed to take charge of the new department. Among other articles, Dixon's silica-graphite paint, a preservative coating for metals, and Dixon's pure flake graphite for lubricating purposes will receive special attention.

John G. A. Leishman, President of the Carnegie Steel Co., will retire from that position April 1, and be succeeded by Charles M. Schwab, who has been in the mechanical department of the company for many years and also a member of the Board of Managers. Alexander R. Peacock, in charge of the sales department, has been made First Vice-President, a new position. Lawrence C. Phipps, Treasurer for several years, becomes Second Vice-President and Treasurer. Henry W. Oliver, Jr., formerly President of the Oliver Iron & Steel Co., has been made head of the ore department. He has left for Europe, with a view of extending the company's interests in that country.

E. A. Schwarzenberg has formed the firm of E. A Schwarzenberg & Co., with offices in the Western Reserve Building, Cleveland, O. The company will make a specialty of railroad scrap and relaying rails.

A. T. Shoemaker, at one time connected with the Illinois Steel Co., at Joliet, and for the past two years with the Otis Steel Co., has decided to carry on an iron and steel commission business and has opened an office in the Wade Building, Cleveland, O.

E. H. Hipple, 1410 Fisher Building, Chicago, has sold for the Bucyrus Co., of South Milwaukee, Wis., to the Northern Pacific Railroad, six 40-ton standard steam shovels. The Bucyrus Co. has also sold to the Great Northern four 60-ton shovels.

Shoenberger & Co., of Pittsburg, Pa., is having installed at its works a complete electric lighting and power plant consisting of one 400 H. P. vertical cross compound engine directly connected to 225 Kilowatt generators, and one 175 H. P. vertical compound engine direct connected to 125 Kilowatt generator. The engines were furnished by the Ball Engine Co., Erie, Pa., and the generators by the Siemens-Halske Electric Co., Chicago.

The Junction Iron & Steel Co. of Mingo Junction, O., contemplates the addition of two or more finishing mills to its plant in the near future.

D. McKay, W. W. Orreck and A. Beals are mentioned as incorporators of the Voluti Nut Lock Co., of Fort Wayne, Ind. The capital stack will be $50,000.

Julian L. Yale, for the past eight years General Sales Agent of the Illinois Steel Co., at Chicago, and Townsend V. Church, formerly of the same company, have entered into partnership under the firm name of Julian L. Yale & Co., with office at 1,117 The Rookery, Chicago. The new company will deal in general railroad supplies and will act as agents for manufacturers of iron and steel products.

The Bond Steel Fence Post Co., of Adrian, Mich., has received a contract from the government to furnish steel posts for mail boxes during the next four years. The prices is given as $1.20 for each post.

The Babcock & Wilcox Co., of Elizabeth, N. J., has just been awarded a contract for furnishing the Central Railroad of New Jersey with six batteries of water tube steam boilers to replace the old style boilers now in use at No. 2 Planes Ashley, Pa. The new plant will be capable of generating steam up to 3,000 H. P.

The annual meeting of the Niles Tool Works Co., of Hamilton, O., resulted in the election of the following officers: President, Alexander Gordon; Vice-President, J. D. Barker; Treasurer and General Manager, R. C. McKinney; Secretary, J. K. Cullen; Superintendent, George T. Reiss.

At the annual meeting of the stockholders of the Newburyport Car Co., held at Newburyport, Mass., Feb. 15, these officers were elected: President, E. P. Shaw; Treasurer and Secretary, W. F. Runnells; Directors: S. P. Shaw, W. F. Runnells, D. B. Pierce, L. W. Sargent and Lemuel Marquand.

Augustine Dowdell, formerly General Eastern Agent of the Gould Coupler Co., of New York City, has taken a position in the railroad department of the Valentine Varnish Co., of 57 Broadway, New York City. Mr. Dowdell assumed his new duties Feb. 15.

Henry R. Worthington, of 86 Liberty street, New York City, has been awarded the contract to furnish pumping machinery for the water-works for the city of Chicago, for $137,000.

Iron and Steel.

At the annual meeting of stockholders of the Oliver Iron & Steel Co., on Feb. 9, H. W. Oliver retired from the Presidency and was chosen Chairman of the Board. James H. Oliver was elected President, and with these officers the directory is composed of David B. Oliver, John Phillips and Daniel A. Moore.

At the recent annual meeting of stockholders of the Central Iron Works, Harrisburg, Pa., the following officers were elected for the ensuing year: Charles L. Bailey, President; Edward Bailey, Vice-President; G. M. McCauley, Treasurer; S. B. Boude, Secretary. In 1896 the plant rolled 50,000 tons of plate, including bridge and tank material.

The Totten & Hogg Iron & Steel Foundry Co., manufacturer of tin mills, rolling mill machinery and engines, has received an order from the American Tin Plate Co., at Elwood, Ind., for three 24-in. hot mills complete.

The Oliver & Snyder Steel Co. has recently been formed at Pittsburgh, Pa., by the consolidation of the interests of the Hainsworth Steel Co., of Pittsburgh; Edith Furnace, in Allegheny; Rosena Furnace, at New Castle, Pa.; the coke property of the Oliver Coke & Furnace Co., in the Connellsville region, and the Oliver-Hainsworth holding in the Carnegie-Rockfeller ore combination. A charter has been applied for, and the capital stock has been put at $1,500,000. The new company will continue the operation of the above-named plants from general offices in Pittsburgh.

Furnace D of the Edgar Thomson Steel Works, at Braddock, Pa., was blown in on Feb. 10. This furnace has been out of blast since April. It will furnish employment for 200 men. Two more rail mills were put in operation at the works on Feb. 14, giving employment to 350 men.

New Stations and Shops.

The Canadian Pacific will build a new station at Dalhousie Square, Montreal. Messrs. Labelle & Fayette have received the contract for all stone and brick work, roofing and marble, while the rest will be done by the company. It is said that the cost will be over $300,000.

The contract for the train sheds to be built over the tracks of the Gulf, Colorado & Santa Fe, at Santa Fe, N. Mex., was awarded on Feb. 5 to the Missouri Valley Bridge & Iron Works, of Leavenworth, Kan.

The Mexican Central Hospital Association will build a new railroad hospital at Tampico. Plans have already been submitted, and the building is expected to be completed during the year.

The Erie road has awarded a contract to Fahey & Co., of Hornellsville, N. Y., for a new depot at Rutherford, N. J., to cost $13,000.

The Roof-Shield in the Boston Subway.

The following data concerning the shield which we described in our last week's issue were not received in time for publication in that article: Cost of shield and appurtenances complete, about $9,000; weight, 22 tons. Maximum calculated load, 320 tons. The cost of constructing the subway by this method is not yet computed, but probably does not differ much from shallow cuttings. Many boulders occur; when small they are pushed out of the way; when large, they are split in two. No accidents or serious difficulties have been encountered, and the work has been thus far entirely successful.

The McKenna Re-Rolling Process.

The newspapers have stated recently that the organization of a company for re-rolling rails by the McKenna process has been completed and that works would soon be built. Our understanding of the matter is that this organization has been in existence two or three years, but that it has been difficult to finance the project because of the hard times. Mr. McKenna has now secured the money to build a plant at Joliet, but what effect the destruction of the Steel Rail Association will have on his plans one can only conjecture. Good judges consider that re-laying rails cannot be sold now, because of the low prices of new rails; therefore, it is a fair presumption that railroad companies will be all the more ready to re-roll rails which they cannot sell.

Preserving the Ties in the Boston Subway.

The West End Street Railway Co. of Boston has just placed an order with Fred. A. Kummer, C. E., 72 Trinity place, New York, for a large quantity of the preservative, woodiline, made by the American Wood Preserving Co., of Philadelphia, Pa., of which Mr. Kummer is general representative. The material will be used in treating the ties which the West End Co. will lay in the new Boston subway. Other orders have been received recently for the material from the Bangor & Aroostook Railroad and from the Princeton, N. J., Water Co. As our readers probably know, this material is a liquid wood preservative, composed of wood creosote and several other ingredients, which has been used by many roads for preserving ties, bridge timbers and similar work. The material enters the wood by simple immersion, without resort to the more expensive methods of forcing under pressure. It has given good results in penetrating and preserving hard woods, such as black and white oak, which are not readily treated by other methods.

Duluth Harbor.

Bids have been opened for dredging the harbors of Superior and Duluth under the continuing contract system. The work is estimated to take four years and to involve the moving of 21,000,000 cu. yds. of material. Bids were received from three local concerns and from contractors in Philadelphia, Toledo, Chicago, San Francisco and other cities. The bids ranged from $1,655,000 to $2,876,000.

Torpedo-Boat No. 6 Tested.

The official trial of torpedo-boat No. 6, recently completed by the Herreshoffs, was made on Feb. 10, off the harbor of Newport. The trial was made over a 12-knot course, the course being covered five times. The total 60 knots were covered in 125 minutes and 18 seconds, or at the rate of 28.74 knots per hour, while the requirements were 27½ knots. The performance of the boat has been considered so satisfactory that Secretary Herbert has waived the usual formalities in the acceptance of naval vessels and has already accepted the boat, which is now enrolled on the naval lists. The Cushing will be taken at once to Norfolk, Va., and her crew will be sent back to Newport to man No. 6, which will then be brought to Washington in order that she may be seen by the naval committees of Congress.

The Boston Elevated Railroad Again.

The charter of the Boston Elevated Railway Co. has been bought by a strong syndicate backed by Kidder, Peabody & Co., and a bill has been introduced in the Legislature altering and enlarging its provisions in several important respects. The principal feature of the bill is the avoidance of all elevated structures in the congested district, and the use of the subway. Branch lines on the north run to Charlestown and Cambridge, and on the south to Roxbury and South Boston, these being connected by a line between the North and South Terminal railroad stations via Atlantic Avenue, as well as by the subway itself. Other features are: 1. The use of "electricity or other motive power except steam." 2. The corporation shall have the right to remove obstacles, such as poles, wires, street pipes, etc. 3. The property of the West End Street Railway may be leased, purchased or operated by the corporation. 4. Immunity is granted from all taxation for 30 years, except its taxes as a street railroad company and a percentage based on its annual dividends. 5. A fare of five cents for a continuous passage between any two points, which fare may not be reduced by law for 30 years. 6. Free transfers on all its lines. 7. Lines connecting railroad terminals (*i e*, the Atlantic avenue branch) may be so constructed that cars may be hauled thereon, and such cars, freight and baggage are permitted to be hauled on these lines. 8. Cambridge street to be widened near the incline connecting with the subway, and other inclines to be similarly provided for. 9. The corporation must deposit $300,000 with the State Treasurer, to be forfeited if it negligently fails to build at least five miles of double track within two years. Undoubtedly this is a *bona fide* effort to build an elevated railroad in Boston, and the work will be prosecuted as soon as the legislative permission can be obtained; but the latter will evidently not be plain sailing, as there are no less than four other petitions for elevated railroads now before the House, whose supporters will make common cause against it; there will also be a strong opposition from some citizens.

THE SCRAP HEAP.

General Manager Greene, of the Baltimore & Ohio, has directed that hereafter the conductors of excursion trains shall be relieved of the duty of collecting tickets and fares, so that they may give their entire time to the management of the train. This order has been issued in view of the large traffic expected at the time of the presidential inauguration.

The Directors of the Chicago & Western Indiana and others interested are considering plans for a Young Men's Christian Association building at the Polk street

passenger station, in Chicago. The roads using this terminal are the Chicago & Grand Trunk, the Wabash, the Atchison, Topeka & Santa Fe, the Louisville, New Albany & Chicago, the Erie and the Chicago & Eastern Illinois. An option has been secured on a four-story building near the station, which for $7,000 could be converted into a railroad men's building, with a restaurant, 25 sleeping-rooms and the other usual conveniences.

The Railroad Commissioners of Iowa have recently published a letter on the general subject of the rates of fare in Iowa, the cost of carrying passengers, and the fairness of the present tariffs as between the railroads and the public. The letter contains a careful study of the amount and density of traffic in different parts of the United States, density of population, comparisons with English and other European passenger tariffs and other instructive matter. This letter was brought out by an inquiry from the State Agricultural Society; but, if we can judge by the reports in Chicago papers, the only thanks the Commissioners get for the pains they have taken to illuminate this subject is an accusation from the farmers that the Commissioners' statement of opinion, advising against a reduction of fares, "has been prepared by the railroads."

Judicial Decisions.

The act of 1887, forfeiting the land grant of the Atlantic & Pacific Railroad, has been sustained in all points by the Supreme Court of the United States, the opinion being read by Justice Brown. It was exhaustive, reviewing all the defenses set up by the company, and finding against it on every point. The case came to the Supreme Court from the Supreme Court of New Mexico, on appeal by the railroad company from a judgment in favor of Robert Mingus, but applies more particularly to the land grant for that portion of the proposed line between Sapulpa, I. T., and Albuquerque, N. M., which was never constructed.

The titles of the Union Pacific, the Winona & St. Peter and the St. Paul & Sioux City roads to certain lands in Kansas and Minnesota, patented to them under the grants made by Congress, which had been attacked by the United States in behalf of homestead settlers thereon, have been confirmed by the Supreme Court of the United States. The cases all came from the Court of Appeals for the Eighth Circuit and the opinion was prepared by Justice Brewer.

The Virginia Supreme Court of Appeals has refused the petition for a mandamus for the City of Portsmouth, to compel the Atlantic & Danville Railroad to re-establish its seaboard terminals and general offices in that city, in accordance with the terms of an agreement under which the city subscribed $150,000 of bonds of the company. The Court holds that the purchasers of a railroad cannot be held for debts or performances of contracts of the previous company.

The Louisiana Supreme Court has declared null and void the ordinance passed some months ago by the New Orleans City Council giving the Illinois Central Railroad the privilege of erecting wharves and docks on the river front at the foot of General Taylor street. The railroad purchased some 60 acres of land there, and obtained from the Council the right to connect this property with its main line and to build wharves there. The Illinois Central has expended over $100,000 already on the property, erecting a large grain elevator, warehouses, cotton presses and wharves, and the improvements were formally dedicated in October last as the "Stuyvesant docks," by President Stuyvesant Fish. Suit was brought against the railroad by the Louisiana Construction Company, or wharf lessees, whose wharfage receipts were considerably reduced by the free wharves of the Illinois Central. The Court, by a vote of three against two, decided that the river bank is the property of the whole people, open to all traffic, and cannot be set aside to the special use of any one company.

The Court of Appeals of the District of Columbia has sustained the decision of the Police Court in punishing locomotive engineers by fine and imprisonment for failing to obey a police regulation requiring trains of the Baltimore & Ohio and Baltimore & Potomac railroads to be stopped before passing certain street railroad crossings. The men when arrested and sent to the workhouse (in default of payment of fines) sued out writs of habeas corpus, and the railroad companies tried to obtain an injunction, but to no avail. The Court holds that the District Commissioners have full power to make the regulations referred to, under a joint resolution of Congress passed Feb. 26, 1892; and, further, that "what may be a reasonable requirement in one case cannot be determined by a fixed rule, but must depend on special circumstances. Such regulations may be inconvenient and oppressive in a certain sense, but it does not follow that it must be declared beyond the power of the legislative authority. In a case where the question of the invasion of private rights is one of practical fact unsettled by experience, a court should surely hesitate to set up its judgment in opposition to the observation and experience of the municipal officers, who ought to be well informed and capable of arriving at satisfactory conclusions." Referring to the contention of the railroad companies that the regulations are unreasonable, the Court remarks that had they "undertaken to obey the regulation in good faith and given its operation a fair test before engaging in litigation, we might have had abundant evidence by which the question of reasonableness could be readily determined. As it is we have no satisfactory proof that would justify us in overruling the action of the Commissioners." In conclusion, the Court says that if the regulations conflict, the Commissioners would no doubt so amend them as to remove the alleged difficulty. Finding no error in the proceedings below, the Court holds that the defendants were duly convicted under valid law, and must abide the judgment of the Police Court.

Grade Crossings in Washington.

The problem of elevating the tracks of the Pennsylvania (Baltimore & Potomac) in the streets of Washington and the abolition of some lines of track, for the relief of street traffic, which has been under consideration for a year or two, has been made the subject of a special report of the Commissioners of the District of Columbia to Congress; and from a sketch of this report in the Washington *Star* we learn that, of several alternative plans considered, the Commissioners recommend one in which the passenger station of the Pennsylvania, now on Sixth street, very near Pennsylvania avenue, shall be moved out to C street, and the line or the road for trains (from Baltimore) going across the Potomac River shall be changed from its present location to one nearer the river. By the proposed plan the main line, after emerging from the tunnel near the Navy Yard, instead of proceeding northwesterly toward the present station, is to be carried directly westward on K street to Eighth street; the line to the bridge will thence continue along the shore of the river (Water street), while a branch will diverge northward to the proposed station. There will be a Y at H street to admit to the station trains from the South, thus making the station a headhouse for all trains, the same as at present. It is proposed that the new line, so far as it lies in the streets, shall be upon an elevated iron or steel structure.

The Commissioners say that this plan, if carried out, will involve the expenditure by the District of about $258,000 for changes of street grades, $100,000 for purchase of real estate and an additional sum for restoring street where tracks shall be taken up, also an indefinite amount of damages to private property. There will also have to be granted 120,000 sq. ft. of public land, additional to that now used. Recognizing that Washington is not a commercial city, the Commissioners say that possibly the District ought to bear a larger portion of the expense than is here indicated.

Illinois Steel Company.

The annual meeting of the Illinois Steel Company was held Feb. 10. President Gates, in his report, says the year has been very unsatisfactory. In April there were orders on the books for over 500,000 tons. The Chicago convention put customers where they could not take and pay for goods. Orders are now on the books sufficient to absorb practically all the inventory of material and greatly reduce by Aug. 1 outstanding obligations.

Directors H. H. Porter and J. C. Morse have retired, and Cornelius C. Carter, of New York, and I. L. Elwood, of Illinois, have taken their places. Secretary and Treasurer Gray has retired, and W. A. Green has been appointed Secretary and W. H. Thompson Treasurer. W. L. Brown, Nathaniel Thayer, A. J. Forbes-Leith and J. W. Gates were appointed a Finance Committee.

The statement of the company for 1896 shows that pig iron and spiegeleisen made amounted to 946,207 tons; tonnage raw material received, 3,571,984 tons; finished product shipped, 773,673 tons; number cars of material handled, 127,550 tons; average number of men employed daily, 9,608; wages and salaries paid, $6,729,031; freight paid, $5,118,479; Dec. 31, 1896, material and supplies on hand, cash, bills and accounts receivable, as shown by the balance sheet, were $11,808,266; less bills and accounts payable and interest accrued, $5,773,391, leaving $6,034,875, to which should be added the securities owned not included in railroad stocks and bonds, $3,121,712. Total convertible assets in addition to plant, $9,156,588.

South American Notes.

The Argentine Board of Public Works has asked for an appropriation of $47,000 to complete the surveys for a railroad extension northward to Bolivia.

A new railroad is projected in Peru to connect the town of Pozuzo, a coca-growing center, with Oroya, the present terminus of the Central (Lima and Oroya) Railroad.

The Barranquilla Railway & Pier Co., handling goods in transit from the ocean pier to Barranquilla and the interior of Colombia, reports gross receipts for the past year of $544,377, as against $297,026 in the previous year. The net profit was $128,755, and the working expenses have been brought down from 65.22 per cent. in 1895 to 40.84 per cent. in 1896.

The Amazon Telegraph Co., operating the fluvial cable from Para to Manaos, in Brazil, has been experiencing the anticipated difficulties of breakage of the cable due to excessive floods, but in spite of several such interruptions, it is able to report receipts from messages alone, not including the government guarantee, of $26,110, from the opening of the line on Feb. 12, 1896, to June 30.

The Mogyana Railroad of Brazil, owned and operated entirely by Brazilians, has by its recently completed extension to Araguary in the states of Minas Geraes, a total length of 692 miles of track. It is also building westward toward the state of Goyaz, in which state the future Brazilian capital will be located, and will soon have connection opened from its present terminus (Araguary) to Catalao. As soon as this point is reached another company will build a line from Catalao to Palma in the state of Goyaz. The ordinary shares of the Mogyana line (par value $500) are now quoted at $515 in the open market.

Kiel Canal Regulations.

Ambassador Uhl, at Berlin, sends the State Department a copy of the new regulations for the safe transit of vessels through the Kaiser Wilhelm (Kiel) Canal. They provide that all vessels, including those carrying a high deck cargo, shall have no heavy list; that the cargo shall be properly stowed and secured, to prevent shifting in case of going aground; that the vessel must not be "cranky," as in the case of narrow ships making a sharp change of direction; that the capstan and winches shall be clear for immediate use; that the position of the wheel shall permit the helmsman to have a free lookout forward and that ballast tanks shall be filled. Vessels with heavier draft forward are supposed to steer badly, and are rigorously cared for, the superintendent of the port having the power to exclude them at night or to order a tug to their assistance.

A Lecture on the Locomotive.

Mr. Richard A. Smart, Instructor in Experimental Engineering, at Purdue University, gave an illustrated lecture on the "Development of the Locomotive," at the Chicago Manual Training School, on Monday, Feb. 15. This lecture was illustrated with some seventy stereoptican views, showing the construction and erection.

Telegraph Poles in the Arizona Desert.

Railroad men are not generally credited with the highest genius as romancers, though the round-house liars' circle is a well known feature in many places; but Mr. Joseph Munchausen Donner, Superintendent of Telegraph of the Southern Pacific at New Orleans in a "story" given to the *Times-Democrat* of that city, gives evidence of a kind of ability which is worthy of the editorial page of the New York *Sun*. Mr. Donner says: "Telegraph poles along the line have a hard time. Particularly is this so out West, where the poles are costly and stations are few and far between. Now, out in the Arizona desert the poles are played the deuce with generally. There is a sort of woodpecker that picks the posts absolutely to pieces, thinking there may be insects inside of the wood. They hear the humming and haven't sense enough to know what causes it. Then near the hills the black bears hearing the noise imagine that each pole contains a swarm of bees, and they climb to the top and chew the glass insulators to pieces. But the sand storms are the things that create the most havoc. When the winds blow strongly the sand is drifted at a rapid rate and the grains cut away the wood at a fearful rate. It was a common thing to have an oak pole worn to a shaving in a day's time, while I have seen poles ground to the surface of the earth during a single storm. Things got so bad out there that the company decided to substitute steel poles for those of the oak and cedar, but that didn't remedy the evil at all. The sand just wore away the metal on each side of the pole until the center was as sharp as a razor, and all the Indians in the country used to shave themselves on the edge. We finally managed to fix things. Just painted the poles with soft pitch. The pitch caught the sand, and now every pole is about 2 ft. thick and solid as a rock."

LOCOMOTIVE BUILDING.

It is stated in a Richmond paper that the Chesapeake & Ohio will shortly order some new engines. We understand that there is some little foundation for this report, but the order will be small.

The Allegheny Valley road has just completed at its Verona shops a new locomotive with 17 × 24 in. cylinders and 62-in. drivers. It is stated that probably three more of the same type will soon be built.

The Brooks Locomotive Works, of Dunkirk, N. Y., on Feb. 11, shipped the first of the order for five engines for the Mexican Central, referred to in our issue of Dec. 11, 1896. The same company is also building an engine for the Buffalo & Southwestern.

CAR BUILDING.

The Chesapeake & Ohio has awarded a contract to the Ensign Mfg. Co., of Huntington, W. Va., for building 100 hopper bottom coal cars of 40 tons' capacity each.

It is reported that the Wells & French Co., of Chicago, are building 100 cars after specifications of the Atchison, Topeka & Santa Fe, but the name of the contracting party is not given.

The Bangor & Aroostook Railroad has just received its entire order of 408 platform, 180 box and 5 caboose cars from the Jackson & Woodin Manufacturing Co., of Berwick, Pa. The order was referred to in our issue of Dec. 18, 1896.

The Carnegie Steel Co. has requested car companies throughout the country to submit bids for several hundred steel cars. Drawings and specifications for these have been prepared by the Carnegie Company and the Pittsburgh, Bessemer & Lake Erie Railroad Company. They are to be double hopper cars, of 100,000 lbs. capacity; 30 ft. long over all; 8 ft. 11 in. wide and to have either the Fox, Schoen, Kindl or the pressed steel diamond truck, as made by the Schoen Co.

G. F. Evans, General Manager of the Maine Central, is having a passenger coach fitted up in the Waterville shops to be used by him as a private car. The car is 60 ft. long and will be finished in whitewood stained to imitate California baywood. It will be divided into seven compartments, consisting of an observation room, dining room, private room equipped with desk, chair and a bed, sleeping room, kitchen and two toilet rooms

Mr. O. Teachout, Superintendent of railway mail service in Texas, says that the Southern Pacific is to provide five new postal cars for use between New Orleans and Houston. The cars, which will be built by the Pullman Palace Car Co., will be vestibuled. They are to be 50 ft. long, and will be equipped with Baker heaters and Pintsch gas. It is further stated that the Southern Pacific will overhaul at its shops the present 30-ft. and 50-ft. postal cars in service and refurnish them with the best fixtures.

The John Stephenson Co., Limited, of New York City, is building 150 open street cars for the Metropolitan Traction Co., of this city.

BRIDGE BUILDING.

Anderson, Ont.—The Council of this place will build a large bridge over the Canard River, on the second concession of Anderson.

Ascot, Que.—The municipality of Ascot is advertising for tenders for rebuilding the steel bridge near Capelton, known as the Wilson bridge.

Atlanta, Ga.—Bids are asked until March 1 for building a steel highway plate-girder bridge, with wooden floor, over the railroad on Bell street. The bridge will have four spans, one 51 ft., another 48 ft. and two 41 ft. 6 in. It will be 59 ft. wide, including side walks. Plans and specifications will be furnished on application to R. M. Clayton, City Engineer.

Brandon, Man.—The City Council is now calling for tenders for a steel bridge across the Assiniboine River on First street, to be Howe truss, three spans, each 80 ft., from plans prepared by Mr. W. H. Shillinglaw, City Engineer.

Fulton, Ark.—It is said that the Texarkana & Fort Smith will build a bridge over the Red River near here. W. A. Williams, Manager, Texarkana, Tex.

Greenwood, Miss.—The County Supervisors have passed an order to issue $22,000 in bonds for the construction of a bridge across the Yazoo River.

Houston, Tex.—It is said to be the intention of the Houston, East and West Texas to put up new iron bridges along its entire line. The bridges now standing were built for a narrow gage road and will not be equal to the demands which will be expected of them.

McKeesport, Pa.—It is said that arrangements are being completed for the erection of the Central bridge across the Monongahela River from Armstrong street, with landing on Fifth avenue.

Marshall, N. C.—The North Carolina Legislature has passed a bill empowering the Madison County Commissioners to levy a special tax to build an iron and steel bridge across the river near this place. The Chairman of the Board of County Commissioners has charge of the matter.

Monroe, La.—The President has approved the bill authorizing the construction of a bridge across the Ouachita River, opposite here.

Peterboro, Ont.—The County Engineer has been instructed to prepare plans for an iron bridge with stone abutments to replace the one known as Preston's bridge; also for a new bridge over the River Cluse in the township of Asphodel, in lieu of the present steel bridge.

Titusville, Pa.—A new bridge of 180 ft. span is projected across Oil Creek at this place. Joseph Smith is City Engineer.

Toronto, Ont.—The city is asking power of the legislature to issue $55,000 debentures for building an overhead traffic bridge on York street; also for power to construct a railroad bridge between Toronto Island and the mainland.

Wilkes-Barre, Pa.—Councils have asked the City Engineer to report the probable cost of a new bridge between the First and Second Wards, spanning all the railroads in North Wilkes-Barre.

Winnipeg, Man.—The Manitoba government calls for tenders for a new bridge over the Assiniboine River near De Clare, to be built in the Spring.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In the Federal Court it is held that the method of redress by readjusting rates must always be left, in the first instance, at least, to the carrier itself; and an arbitrary and peremptory order to abandon a long-established accessorial cartage service at a particular place, without regard to any rates, or without any option to readjust them, is unlawful.[1]

In the same case it is said that for a carrier to protect itself against the physical disadvantage it is under in relation to its rivals is not an unlawful discrimination, if it be not used as a colorable device to evade the statute.

In Virginia the Supreme Court rules that the state may, in order to secure and protect the lives or health of its citizens, or to preserve good order and the public morals, legislate for such purpose, in good faith, and without discrimination against interstate or foreign commerce, without violating the interstate commerce clause of the United States Constitution.[2]

In New York the Supreme Court holds that a statute which requires railroads to issue mileage books to any person applying therefor is not *prima facie* so unreasonable as to be an unlawful interference with the rights of the company to transact business.[3]

In a case in the Federal Courts the A. Railroad connected at T. with the C. Railroad and the W. Railroad. Both A. and C. were engaged in interstate commerce, reaching by their own lines and connections the same regions. By the W. they both made connections with other important roads and with routes of water transportation. For a considerable time, the W. road charged the same rate for tranportation over its line of freight received from or destined to either of the others, but in December, 1895, it withdrew these rates as to the A. road and thereafter charged for transportation over its line, of freight received from or destined to the A. road, the full local rate allowed by statute, which was considerably higher than the rate previously charged to both and still charged to the C. road. There had been no change of conditions, and the service rendered to both roads continued to be substantially the same. The Court holds that the charge of such increased rate was an unlawful discrimination, not justified because the rate charged was the statutory local rate, and the transportation over the W. road was wholly within the state, nor by the facts that the A. road was a small and weak road, whose business was unimportant as compared with that of the C. road, or that there was no direct connection between the tracks of the A. and W. roads, the tracks of the C. road being used for switching, it not appearing that the C. road objected to such use of its tracks; and, accordingly, that the W. road should be enjoined from exacting more from the A. road than from the C. road, for similar services.[4]

In Pennsylvania it is laid down that a company chartered under the general railroad act of 1868, as a steam railroad, cannot construct and operate a street-passenger railway.[5]

Injuries to Passengers, Employees and Strangers.

In Georgia it is decided that the fact that a conductor declined to receive a coin of a peculiar appearance, which, however, was legal tender in payment of a fare, only because he in good faith believed it a counterfeit, did not relieve the carrier from liability for the conductor's ejection of the passenger, because of the latter's refusal to pay fare with other money.[6]

In Illinois defendant sold to plaintiff ticket brokers a quantity of tickets over its own road, with coupons attached for transportation over a connecting line. Said tickets were issued under an agreement with said connecting road, and were for a number of years honored by the latter road, and until it passed into the hands of a Receiver, who was ordered by the Federal Court to refuse to accept for passage the remainder of said tickets. The Supreme Court holds that in selling said coupons defendant acted merely as agent for the connecting line, and was not liable for the latter's failure to perform in the contract.[7]

In Alabama plaintiff purchased a railroad ticket limited to the date indorsed thereon; and, though he did not read the indorsement, he knew that the company was selling such tickets, and his attention had been called to similar indorsements. On the conductor's refusal to accept said ticket, because it was out of date, plaintiff declined to pay fare, permitted himself to be led to the platform and gently ejected, after which he reentered the car and paid the fare to his destination. The Supreme Court holds that plaintiff had no cause of action against the company.[8]

In New York it is not negligence per se for a passenger to ride on the front platform of a horse car.[9]

In Illinois it is held that where a passenger who had just boarded a street car, and was walking to a seat, was injured because of the sudden starting of the car before the lapse of a reasonable time for the passenger to seat herself, the company was liable for the injuries.[10]

In Texas a passenger on a train, who was somewhat intoxicated, and walked a number of times through the cars, looking for some one, though he conducted himself without offense toward the other passengers, accidentally stumbled over some baggage; and a revolver fell from his pocket and was discharged, wounding another passenger in the foot. The Supreme Court holds that the carrier had no reason to anticipate such an accident, and was not liable for the injury.[11]

In Illinois it is laid down by the Appellate Court that a sleeping-car company, by providing call bells for its berths, holds out notice that such bells will be responded to when rung by passengers occupying such berths.[12]

In Indiana a complaint alleged that plaintiff, a passenger on defendant's train, desiring to get off at a certain crossing where the train was accustomed to stop, was informed by the conductor that he could get off there, and was directed to go out on the platform when the train reached a certain point, ready to get off as soon as the train stopped at the crossing, as it stopped but a moment; that plaintiff went on the platform as directed, and stood on the lower step of the car; that the train slowed down, but by a sudden release of the brakes started again with a jerk, throwing plaintiff under the car, by which he was injured; that the place at which he was directed to get off was not a safe and proper place, and the injury occurred by reason of the negligence of the defendant. The jury returned special findings that the accident occurred at a switch about 1,600 ft. from the crossing, where the engineer slowed down to pass the switches; that the stopping place was only about 250 ft. from the crossing; that plaintiff's position on the lower step was dangerous, and was known by him to be dangerous. The Supreme Court holds that the special findings did not support a verdict for plaintiff.[13]

The Appellate Court of Illinois rules that a railroad is not liable to the penalty for obstructing a public highway, merely because it leaves a car projecting slightly over a highway crossing, if it does not interfere with public travel.[14]

The Supreme Court of Virginia decides that the statute limiting the quantity of land to be held by railroads, does not render void a conveyance in excess of such quantity; and the company may, before proceedings are instituted by the state to forfeit its title, convey an indefeasible title to another.[15]

In the Federal Court it is held that the fact that a railroad lies wholly within one state does not exempt it from the obligations imposed by the interstate commerce act, if the transportation over it is part of a shipment from one state to another, or to or from a foreign country.[16]

In Missouri it is ruled that under the statute authorizing railroad corporations to contract with each other in any manner not inconsistent with the scope, object and purpose of their creation and management, one railroad corporation, including leased lines, may make a valid contract with another to take its entire road and operate it for a term of years.[17]

In Kentucky it is held that where a contract of hiring does not bind the employee to serve the employer either a definite or indefinite time, the employer may terminate the contract at any time, though he agreed to give the the employe work as long as he did honest and faithful work.[18]

The Supreme Court of Rhode Island holds that injury from a telegraph pole erected dangerously close to a side-track is not a risk assumed by a railroad employee, unless he has knowledge of the defect or competent means of knowing it and continues in the employment.[19]

In the Federal Court it is decided that a local telegraph operator at a station on the line of a railroad, who receives and delivers the orders of the train dispatcher in respect to the movements of trains, is the fellow-servant of the employees of the railroad company in charge of the train; and such employees, if injured in consequence of the negligence of the telegraph operator, cannot recover damages from the railroad company.[20]

In the Federal Court it is laid down that at a place where several thousands of persons cross the switching tracks of a railroad daily, and where no effort is made to stop them, by fencing, posting notices, or otherwise, persons attempting to cross are not mere trespassers, and the company is bound, not merely to refrain from wanton or willful injury after discovering them, but to anticipate their probable presence, and move its cars with reasonable precautions and a proper regard to their safety.[21]

In Illinois it is ruled that evidence that deceased waited on the west side of the track, at a public crossing, till a south-bound train passed, his view of the opposite track in the immediate vicinity being obstructed by such train and by a building, and then started to cross, when a north-bound train on the east track, approaching at a greater speed than allowed by ordinance, struck and killed him, was sufficient to justify a finding that deceased was free from contributory negligence.[22]

In the Federal Court it is held to be a question of fact in each case whether there has been, with the acquiescence of the railroad company, such a public and customary use of the alleged crossing as to justify the presence upon the track of the person injured.[23]

[1] D., G. H. & M. v. I. C. Com., 74 Fed. Rep., 803.
[2] N. & W. v. Com., 24 S. E. Rep., 837.
[3] Beardsley v. N. Y., L. E. & W., 40 N. Y. S., 1077.
[4] Augusta S. R. v. W. & T., 74 Fed. Rep. 522.
[5] P. R. R. v. Bridgeport, 11 Montg. Co., Law Rep., 73.
[6] A. C. St. Ry. v. Keeny, 25 S. E. Rep., 629.
[7] Chi & A. v. Mulford, 44 S. E. Rep., 861.
[8] McGhee v. Drisdale, 20 South Rep., 391.
[9] Hastings v. Central Crosstown, 40 N. Y. S., 93.
[10] W. C. St. Ry. v. Craig, 57 Ill. App., 411.
[11] G., H. & S. A. v. Long, 36 S. W. Rep., 485.
[12] P. P. C. Co. v. Fielding, 62 Ill. App., 577
[13] Cin., L., St. L. & C. Ry. Co. v. McClain, 44 N. E. Rep., 306.
[14] I. C. v. People, 59 Ill. App., 256.
[15] Fayette Land Company v. L. & N., 24 S. E., 1016.
[16] Augusta S. v. W. & T., 74 Fed. Rep., 522.
[17] St. J. & St. L. v. St. L., I. M. & S., 36 S. W. Rep., 602.
[18] L. & N. v. Offutt, 36 S. W. Rep., 181.
[19] Crandal v. N. Y., N. H. & H., 35 Atl. Rep., 307.
[20] O. S. L. & U. N. v. Frost, 74 Fed. Rep., 765.
[21] Cahill v. C., M. & St. P., 74 Fed. Rep., 285.
[22] Wabash v. Smith, 44 N. E. Rep., 856.
[23] Cahill v. C., M. & St. P., 74 Fed. Rep., 285.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Maine, 3 per cent. on preferred stock, payable March 1

Canadian Pacific, 1 per cent. on common stock and 2 per cent. on preferred stock, both payable April 1.

Mexican Northern, quarterly, 1 per cent., payable March 2.

Milwaukee & Lake Winnebago, 3 per cent. on preferred stock, payable Feb. 15.

North Pennsylvania, quarterly, 2 per cent., payable Feb. 25.

Piedmont & Cumberland, 2½ per cent., payable March 1.

Pittsburgh, West Virginia & Central, semi-annual, 1½ per cent.

West Virginia, Central & Pittsburgh, annual, 1 per cent., payable March 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Missouri Pacific, annual, St. Louis, Mo., March 9.

Norfolk & Southern, annual, Norfolk, Va., March 4.

St. Louis, Iron Mountain & Southern, annual, St. Louis, Mo., March 9.

Tennessee Coal, Iron & Railroad Co., annual, Tracy City, Tenn., March 9.

Technical meetings

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Institute of Electrical Engineers* will hold its 112th meeting at 12 West Thirty-first street, New York, Feb. 17, at 8 p. m.

The *International Association of Car Accountants* will hold a convention at New Orleans, La., on Feb. 23, 1897.

The principal papers to be read are:

Defects in the Car Service Department—W. C. Keeler, C. C. & S.

Efficient Organization of Yards—T. J. Purcell, R. W. & O.

Holding the Baby, or How to Raise Your Car Accountants—C. Brooks, M. & St. L.

Light Weighing and Stenciling Freight Cars—T. S. Bell, P. R. R.

The Private Companies—H. F. Vogel, St. Louis Refrigerator Co.

Car Tracers H. G. Sleight, Vandalia.

Mileage on Cars Handled by Car Ferries—Thomas R. Limer, C. H. V. & T.

The *Street Railway Accountants' Association* will meet to organize in Cleveland, O., March 23 and 24, 1897. For further particulars see issue of Feb 12, page 121.

The *American Railway Association* will hold its convention at Richmond, Va., on April 7, 1897.

The *National Convention of Railroad Commissioners* will be held at St. Louis, Mo., on May 11, 1897.

The *International Association of Ticket Agents* will hold a convention at San Antonio, Tex., on March 16, 1897.

The *Association of American Railway Accounting Officers* will hold a convention at Richmond, Va., on May 26, 1897.

The *Association of Railway Claim Agents* will hold its convention at St. Louis, Mo., during the last week of May, 1897.

The *Master Car Builders' Association* will hold its annual convention at Old Point Comfort, Va., beginning June 8, 1897.

The *American Railway Master Mechanics' Association* will hold its annual convention at Old Point Comfort, Va., beginning June 15, 1897.

The *National Association of Local Freight Agents' Associations* will hold a convention at Washington, D. C., on June 8, 1897.

The *Association of Railway Telegraph Superintendents* will hold a convention at Niagara Falls, N. Y., on June 16, 1897.

The *National Association of Car Service Managers* will hold a convention at Boston, Mass., on June 16, 1897.

The *Train Despatchers' Association of America* will hold a convention at Detroit, Mich., on June 22, 1897.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

The *Denver Society of Civil Engineers* meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary.

The *Engineers' Club of Columbus, (O.)*, meets at 12½ North High street, on the first and third Saturdays from September to June.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Civil Engineers' Society of St. Paul* meets on the first Monday of each month, except June, July, August and September.

The *Engineers' Society of Western New York* meets on the first Monday of each month at the Society's rooms in the Buffalo Library.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building Roanoke, at 8 p. m.

The Engineers' Club of Philadelphia.

A business meeting of the club will be held on Saturday, Feb. 20. The papers will be "Steel as Viewed by the Engineer," by Mr. P. Kreuzpointner: "The Future Habitation of the Club," by President Joseph T. Richards.

Western Society of Engineers.

The Western Society of Engineers held a regular meeting, Thursday, Feb. 18, at Armour Institute, Chicago. Mr. Ralph Modjeski presented a paper, "Erection of the New Draw Span of the Rock Island Bridge." The paper was illustrated by lantern slides.

The Franklin Institute.

At the meeting of Wednesday, Feb. 17. Mr. Thomas Corscaden described and exhibited the "All Wrought-Steel Belt Pulley" of his invention, as made by the American Pulley Co., of Philadelphia. Mr. John Carbutt made an experimental demonstration of the operative methods of photography with the X rays.

National Association of Railway Agents.

This association was organized at Youngstown, O., Feb. 6, and is said to be made up of local freight and ticket agents, local freight cashiers and chief clerks, commercial agents, soliciting and contracting agents, etc. The President is Mr. O. J. Hammon, of Pittsburgh, and the Secretary James Aiken, of Youngstown.

Civil Engineers' Club of Cleveland.

At a regular meeting of the club, held at its rooms in the Case Library Building, Cleveland, O., Tuesday evening, Feb. 9, Prof. Charles H. Benjamin, of the Cass School of Applied Science, read a paper on "Applications of the Electric Motor in Machine Shops." A discussion followed, in which Messrs. John W. Langley, R. L. Newman, George Bartol, S. T. Dodd and others participated.

Engineers' Club of Cincinnati.

The Secretary's report of the Engineers' Club of Cincinnati for the year ending Dec. 17, 1896, shows a membership of 125. During the year ten papers were read, one of them being on the "Organization and Operation of a Maintenance of Way Department," by Mr. Charles E. Lindsay, and one on "Construction and History of the Indianapolis Belt Railway and Stock Yards," by Mr. R. L. Reed.

St. Louis Railway Club.

A regular monthly meeting of the St. Louis Railway Club was held on Feb. 13, at the Southern Hotel, St. Louis. A paper was presented by Mr. J. C. Bartlett, Superintendent of the Burlington Voluntary Relief Department, of Chicago, on "Railway Relief Departments." Mr. Bartlett gave facts and figures showing the beneficial results of the voluntary relief system on the Burlington lines. A brief discussion took place on the subjects which were presented at the January meeting.

Engineers' Society of Western Pennsylvania.

This society held its annual dinner at the Duquesne Club, Pittsburgh, Thursday evening, Feb. 12. About 100 were present. The toastmaster was Mr. G. S. Davison and the speakers were: "The Civil Engineer," E. B. Taylor, of the Pennsylvania Company; "The Metallurgical Engineer," Capt. A. E. Hunt; "The Gas Engineer," George H. Browne; "The Chemical Engineer," W. E. Garrigues; "The Mining Engineer," S. M. Taylor; "The Astronomical Engineer," Prof. J. A. Brashear; "The Electrical Engineer," Charles F. Scott; "The Hydraulic Engineer," J. N. Chester; "The Mechanical Engineer," V. Beutner. The officers of the society are: Emil Swennson, President; George S. Davison, First Vice-President; Harry J. Lewis, Second Vice-President; Reginald A. Fessenden, Secretary, and A. E. Frost, Treasurer.

Canadian Society of Civil Engineers.

On Nov. 19 Messrs. Denis, Hare and Reinhardt, students, Can. Soc. C. E., presented a paper on the "Experiments on Concrete Made at McGill University." The object of the tests was to determine the effect of different percentages of water on the strength of the concrete. The test specimens were cubes of concrete one foot on an edge. The limits were 16 and 30 per cent. of water by weight of cement and sand, which are beyond the extremes of practice on both sides. The experiments are as yet very incomplete; but, as far as they have gone, they show that the additional two per cent. of water, from 22 to 26 per cent., in a concrete of one part of cement (a German Portland), two of sand and four of stone, weakens the same by almost one-half in the one-week compression tests. These tests show, however, that strength is almost completely recovered with time; thus, in the four-week tests, the weakening limit was found to be between 26 and 28 per cent. of water, and in the two-month tests between 28 and 30 per cent. So that, if immediate strength is not required, 28 per cent. of water will not affect the ultimate strength if allowed to stand two months.

Engineers' Club of St. Louis.

The 448th regular meeting was held at 1600 Lucas place Feb. 3. Mr. J. A. Ockerson, as chairman of a special committee, reported that a memorial regarding the improvement of the Delta of the Mississippi River had been prepared and sent to the various engineering societies and members of Congress from St. Louis. The committee having completed its work was discharged. In this connection the President reported that he had received favorable replies from several of the engineering societies and from Congressmen Cobb and Bartholdt. Prof. F. E. Nipher addressed the club on "The Frictional Effect of Trains of Cars on the Air." The instruments and methods used in measuring pressures in the neighborhood of moving trains were described. A diagram containing the results of a large number of tests was shown and the nature and equation of the curve deduced. The value of the constants computed from the equation of the curve and those computed from the observations checked closely. Improved instruments for making these tests were shown and future work in this direction outlined. The discussion which followed was participated in by Professor Johnson and Messrs. Flad, Ockerson, Bryan, Barth, Van Ornum and Baier.

Western Railway Club.

At the regular meeting of Jan. 19 a committee consisting of Messrs. Gibbs, Forsyth, W. A. Smith, Barr and Herr reported an obituary notice on the death of Mr. David L. Barnes as follows:

Our fellow member, David L. Barnes, has been taken from our midst, after a lingering illness. It is difficult for the members of our committee—all of whom were his warm personal friends—to pen formal resolutions in the face of the great personal loss they feel; a man so gifted and a friend so true calls for a biography at loving hands, which shall adequately set forth his admirable qualities of heart and head, that the story of his life may be accessible as a stimulus to youth and a melancholy comfort to those who were fortunate enough to be acquainted with him. Such a biography would, perhaps, be out of place in the proceedings of an essentially practical organization, such as ours, but your committee feels sure the club will gratefully accord a permanent space in its records to the appreciative tribute to his memory, prepared by one of his most valued friends, Col. H. G. Prout, editor of the *Railroad Gazette*, and which they here present.

Mr. Barnes' connection with our club is co-ordinate with its existence as a factor of influence in the railway mechanical world, and his interest and pride in its welfare and growth never for a moment flagged to the day he was so untimely taken from us. A touching illustration of his devotion was the donation of his valuable scientific library to the club, by a wish expressed during the last days of his life.

The members of your committee have from time to time individually served with him as fellow-officers of the club. Mr. Barnes was a constant attendant at the meetings of the executive board—many times at the cost of time that he could ill spare—and his valued counsel and indefatigable energy largely shaped the policy adopted for the club's welfare. His contributions to our papers and discussions were constant, and his versatility remarkable, his well stored mind covering the entire range of matters pertaining to railway motive power, rolling equipment and permanent way. The quality of his work for the club was in all cases so admirable that not a little of the high standing of our Proceedings in the mechanical world is due to the papers he presented and the prominent part he took in our discussions.

The death of our valued friend and fellow-worker leaves a vacancy in our ranks which will be difficult to fill; but severe as our loss it, it is to his family that our respectful sympathy should be directed, in the crushing blow which has fallen upon them. Your committee feels that the expression of our deep personal and professional loss may prove some comfort in their time of affliction.

The question of the interchange of club proceedings was taken up and action deferred until after the secretaries of the railroad clubs shall meet and make their recommendations. This means that for the rest of this club year the practice of the Western Railway Club will not be changed.

A communication was read from Mrs. David L. Barnes stating that it was Mr. Barnes' wish that the club should have an opportunity to take his technical library (a bequest from him) as a nucleus for a club library. The matter was referred to a committee consisting of Mr. William Forsyth, Mr. J. W. Cloud, Mr. F. W. Sargent, Mr. George Gibbs and Mr. Willard A. Smith.

A discussion was then held on Mr. Waitt's paper presented at the December meeting on

SPECIFICATIONS FOR CONSTRUCTION AND INSPECTION OF NEW ROLLING STOCK.

Mr. Gibbs expressed the opinion that most railroad companies can go into the manufacturing business to some extent with advantage to themselves, and in fact must do so. For instance, a foundry is an economical addition. No large railroad company is justified in buying castings outside. The same is true of a brass foundry. A large road can build new freight cars on terms no private enterprise can touch. He agrees with Mr. Waitt in commending the practice of "tying up specifications to require the use of certain proprietary articles."

Mr. Forsyth is of opinion that if a railroad company cannot buy a good car it is because of the lack of good specifications and inspection. His company has found it a very good plan to build a sample car. The inspectors take charge of this in building and become familiar with details. This does away with the dimensioning and defining of a great many small parts. The sample car is left unpainted on one side and is sent to the contractor and is often taken apart by the contractor's foreman to get the exact shape of some castings or forgings.

Mr. McMynn, of the R. W. Hunt & Co., said that a specification should be full and clear. The main reason for faulty specifications is ignorance, carelessness or lack of experience on the part of those drawing them. A specification should be drawn by a practical man. He disagrees with Mr. White in thinking that specifications for steel, for example, should be based on the advice of a reputable steel maker. He thinks it would take a very conscientious steel maker to advise low phosphorus and sulphur if he knew that from his ore and processes he could not get as low a limit as his competitor.

The object of inspection of wheels, axles, coupers and steel is not to subject these articles to even approximately the same strains that they will get in service, but to impress upon the producer the necessity of using knowledge and care. The best manufacturers court rigid inspection.

An inspector must be born. Few men have the tact, knowledge, determination and honesty necessary to insure fairness. A good inspector can get a good position at any time, but you cannot get him without a good salary. A first-class inspector demands a salary of from $1,500 to $2,500 a year. As to cost of inspection, a short time ago inspection work taken away from the Hunt bureau by a large railroad company was given back to it. It had cost that road 18 cents a ton to inspect rails, while the bureau charged them only 5 cents.

Mr. Deems, of the Chicago, Burlington & Quincy, had made an attempt to get some measure of the results of the practice of the last four or five years, during which time much attention had been given to specifications and inspection. He thought that drawbars would be a good place to make an examination, which he did with the following results:

I selected a point where there is a repair yard in which repairs are made to cars in transit only. Cars are not sent in from outlaying points to be repaired, and yesterday I had a list prepared, showing the number of drawbars used at that point from 1892 to 1896, inclusive. I found that in 1892 the number of draw bars applied was 1,268; in 1893, 973; in 1894, 612; in 1895, 247; in 1896, 172.

Those figures taken alone might not indicate much, as it might be assumed that the reduction in the number of bars applied was due to the decrease in business, so I went a little further into the matter and took the total number of cars passing this point each year. These figures I would say are approximate, but they are sufficiently correct for comparison. Then by having the total number of drawbars used, it was an easy matter to determine the number of cars passing for each drawbar applied, and I found that in 1892 one drawbar was applied for each 200 cars passing this point; in 1893, 220; in 1894, 263; in 1895, 545; in 1896 only one drawbar was applied for each 952 cars. I then made a comparison between October, 1892, and October, 1896, the business in those months being approximately the same, and I found that in 1892, 94 drawbars were applied, as against 9 in 1896; 66 draft timbers were replaced in 1892, as against 6 in 1896, or eleven to one. It seems to me these figures ought to be very gratifying to most railroad men, and they certainly show the importance of heeding the suggestions in Mr. Waitt's paper, as they merely reflect the results already obtained by such methods.

In considering this question we must take into account the fact that during the years mentioned cars have been growing larger and heavier all the time, and trains have been growing much heavier in tonnage, all of which would tend to result in an increased number of draw bars pulling out or breaking, but in spite of these facts we find the number of such accidents cut down.

Mr. Manchester, of the St. Paul, in looking over prices of repair parts, finds that the railroad shops can produce them at from 10 to 60 per cent. below the manufacturer's prices. As Mr. Gibbs stated, the repair account of a railroad is its greatest bill, costing many times more than the new equipment, and in designing and specifying this should be taken into consideration.

Mr. F. W. Sargent, of the Sargent Company, thought that the time had come to specify cast steel for many parts of locomotive machinery heretofore made of wrought iron. No locomotive specification would be complete which did not call for cast steel, rocker arms, tumbling shafts, link hangers, brake hangers, frames, etc. Various other parts made of cast iron can be replaced with cast steel with advantage. The same is true of many parts in freight and passenger cars where cast steel could be well specified in place of wrought iron, also in place of cast iron for parts subject to shops' tensile stresses.

Mr. Schroyer, of the Northwestern, took someexception to Mr. Waitt's paper in the matter of manufacturing. The Chicago & Northwestern makes its own axles, paints and brasses. They make axles because they were not buying satisfactory ones. Some makers refuse to follow their specifications, claiming that it could not be done. They make brasses, not because they can make them better than anyone else, but they have the foundry and the facilities, and when the brass is done they know what is in it and how it has been made. They make paints because they used to buy paint at 55 cents a gallon when linseed oil cost 65 cents a gallon. That paint spread well, dried well, looked well, but it did not wear well. They do not claim that they are making better paint than can be bought, but they do claim that they know what is in it, and know that it is going to wear well. They expect their cars to stand 10, 12 and even 15 years without painting.

At this same meeting Mr. Rhodes' paper on The New Enemy of the Air Brake was read. To this we have already called attention, the new enemy being an insect which makes its nest in air-brake retaining valves.

Mr. C. F. Street presented a paper on Water Supply Stations for Locomotives.

The Western Railway Club held its regular meeting in the Auditorium Hotel, on Tuesday, Feb. 16, 1897. The paper presented at the January meeting by Mr. E. M. Herr, entitled "Notes from Work Done on the Chicago & Northwestern Locomotive Testing Plant," and that by Mr. G. W. Rhodes, entitled "The Air-brake Has an Enemy," were discussed.

A topical discussion was held on the subject, "Long versus Short Locomotive Runs," and also a continued topical discussion on the subject, "Water-Supply Stations for Locomotives." A paper was presented by Mr. C. H. Quereau, entitled "Lead for Locomotives."

PERSONAL.

—Mr. W. J. C. Kenyon, General Freight Agent of the Chicago, Burlington & Northern, has resigned.

—Mr. Thomas R. Brown, one of the Receivers of the old Seattle, Lake Shore & Eastern, died on Feb. 2.

—Mr. Joseph A. Miller has been appointed General Purchasing Agent of the Ann Arbor, to succeed F. S. Chandler, resigned.

—Mr. M. B. Leonard, Superintendent of the telegraph service of the Chesapeake & Ohio, died suddenly at Richmond, Va., on Feb. 6.

—Mr. C. A. Pratt has been appointed Manager of eating-houses on the Missouri Pacific and all its controlling lines. His headquarters will be at Little Rock, Ark.

—Mr. W. A. Aird has been appointed Master Mechanic of the Grand Trunk locomotive shops at Point St. Charles, Montreal, to succeed F. L. Wanklyn, resigned.

—Mr. G. P. Corry, formerly Contracting Agent of the Michigan Central, has been appointed Agent of the Graham & Morton Transportation Co., with headquarters in Chicago.

—Mr. Frank Janes, formerly Local Freight Agent of the Pennsylvania, has been appointed General Freight and Passenger Agent of the Findlay, Fort Wayne & Western.

—Mr. C. A. Barnard, General Freight Agent of the Ohio Southern and Lima Northern, has been appointed General Agent of the Baltimore & Ohio, at Cleveland, to succeed L. R. Brockenbrough.

—Mr. John H. Barrickman, formerly Contracting Freight Agent for the Louisville & Nashville, at Memphis, Tenn., has been appointed Traveling Freight Agent of the same company, with headquarters at Louisville, Ky.

—The nominations of Carroll D. Wright, for Commissioner of Labor, and Martin A. Knapp, of New York, for an Interstate Commerce Commissioner, both re-appointments, were confirmed by the United States Senate, on Feb. 12.

—Mr. Frederick L. Pomeroy, General Manager of the Nickel Plate Line, has resigned that position, and has been appointed General Manager of the Red, White and Midland Fast Freight Lines, to succeed George B. Sherman, deceased.

—Mr. Perry Griffin has been appointed Joint Agent at Chicago for the new Chicago-Washington line formed by a combination of the Louisville, New Albany & Chicago, Cincinnati, Hamilton & Dayton, and Baltimore & Ohio Southwestern roads.

—Mr. George W. Dennison, who has been for a number of years Chief Clerk in the office of Division Freight Agent Steenberg, of the Pennsylvania, at Toledo, O., has been appointed Local Freight Agent of the Pennsylvania, to succeed Frank Janes.

—Mr. Julius R. Hartwell, Division Superintendent of the Fitchburg, whose control covered the main line and branches between Boston and Fitchburg, Mass., has resigned. Mr. Hartwell has been in the service of the Fitchburg in various capacities for 43 years.

—Mr. L. R. Brockenbrough, General Agent of the Baltimore & Ohio, at Cleveland, O., and Traffic Manager of the Cleveland Terminal & Valley, has been appointed General Freight Agent of the Baltimore & Ohio, with headquarters at Pittsburgh, to succeed T. W. Galleher.

—Mr. James F. Crook has been appointed Chairman of the Alabama Board of Railroad Commissioners by the Governor of that state, to succeed Mr. Henry R. Shorter whose term expires March 1. The latter will then have served two terms. Chairman Crook is a resident of Jacksonville, Ala.

—Mr. H. P. Hathaway has been appointed General Agent in London of the Chesapeake & Ohio Railway, the Chesapeake & Ohio Steamship Co., and the Kanawha Dispatch. The appointment went into effect on Feb. 13, when Mr. Hathaway sailed for London to open the general offices.

—Mr. George W. Cale, Freight Traffic Manager of the St. Louis & San Francisco, will represent that road in the Board of Administration of the Southwestern Traffic

Association. F. D. Russell, General Freight Agent of the company, will assume charge of the freight department when Mr. Cale goes to the Southwestern board.

—Mr. George L. Forester has been appointed Traveling Freight Agent of the Illinois, Indiana & Iowa, to succeed W. E. Ward, who recently resigned to take charge of the Central States Dispatch interest at Chicago. Mr. Forester has been General Agent of the Burlington system at Hannibal, Mo. The appointment took effect Feb. 15.

—Mr. Ransom H. Colburn died last week, at his home in Chicago. In 1858 Mr. Colburn was Locating Engineer for the Grand Trunk in Canada, and for four years previous to that time was Resident Engineer on the Erie Canal, with headquarters at Buffalo. Among the enterprises engaged in by Mr. Colburn in Chicago was the construction of the Washington street tunnel, which work he superintended.

—Mr. K. Inouzuka, a Japanese lawyer of Tokio, is in San Francisco. Mr. Inouzuka is Consul for the Department of Communication and the Bureau of Legislation of Japan, and has come to the United States to make a study of the laws regulating transportion on American railroads. After a month's stay in this country he will visit England and France.

—Messrs. Patterson & Corwin, certified public accountants, of New York, have been appointed by the Baltimore & Ohio Reorganization Committee of Baltimore to examine the accounts and affairs of the Baltimore & Ohio Railroad Company upon the lines as laid down by the committee in its address to the holders of Baltimore & Ohio bonds and shares. These accountants have for some time been engaged in preliminary work for the committee.

—Mr. A. E. Drought, formerly Receiver of the Florida Midland Railway, has been found guilty by the court at Atlanta, Ga., of being a swindler, and has been sentenced to 12 months of hard labor, or to pay a fine of $1,000. Mr. Drought was arrested in Atlanta in the latter part of January, upon complaint of Eddy & Mayfield of that city, who alleged that defendant, while Receiver of the Florida Midland, sold to them $2,000 worth of bonds of that road, which proved worthless.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—T. W. Galleher, General Freight Agent of the company at Pittsburgh, has been made General Freight Agent at Baltimore, to succeed C. E. Ways. L. R Brockenbrough has been appointed General Freight Agent at Pittsburgh to succed T. W. Galleher.

Cleveland & Buffalo Transit Co.—J. L. Evans, Acting General Freight Agent, having resigned, W. F. Herman will, in addition to his duties as General Passenger Agent, assume charge of the freight department, with the title of General Passenger & Freight Agent. J. J. Neiding has been appointed Assistant General Freight Agent, with headquarters in Cleveland. Both appointments effective March 1.

Cleveland, Cincinnati, Chicago & St. Louis.—J. M. Duncan has been appointed General Southern Agent, with headquarters in Atlanta, Ga.

Columbus, Hocking Valley & Toledo.—L. W. Landman, formerly Southern Passenger Agent, has been appointed General Traveling Passenger Agent, with headquarters at Columbus, O. E. R. Davidson, formerly Northern Passenger Agent, has been appointed District Passenger Agent at Toledo, O., to succeed A. J. Ritchie, resigned.

Cumberland Railway & Coal Co.—The annual meeting of stockholders was held in Montreal, on Feb. 10. Officers were elected as follows: President, R. H. Cowans; Vice-President, George A. Drummond; General Manager, J. R. Cowans; Secretary, H. R. Drummond.

Findlay, Fort Wayne & Western.—Frank Janes has been appointed General Freight and Passenger Agent, and W. V. Hawley, Assistant Freight and Passenger Agent of the road, both with headquarters at Fort Wayne, Ind.

Great Northern.—J. M. Barr, General Superintendent, has resigned, and will be succeeded by Russell Harding, Assistant General Superintendent of the road. Mr. Barr becomes Vice-President of the Norfolk & Western, with office at Roanoke, Va.

Long Island.—At a meeting of the stockholders, held in the Corbin Building, New York City, on Feb. 11, the following new Directors were elected: George W. Young, Theodore A. Havemeyer and August Belmont. The new directors succeed E. R. Reynolds, W. B. Kendall and James D. Campbell. A. C. Bedford, Treasurer of the company, was elected also to the office of Secretary, to succeed D. S. Voorhees, the offices of Secretary and Treasurer being consolidated.

Los Angeles Terminal.—The following appointments took effect on Feb. 8: W. J. Cox, General Freight and Passenger Agent, in charge of traffic; T. R. Shanks, Superintendent, in charge of transportation, machinery and equipment, and E. M. Jessup, Engineer, in charge of bridges, buildings and maintenance of way.

Louisville & Nashville.—J. J. Dignan has been appointed General Agent of the freight and coal department, to succeed the late W. M. Culp.

Memphis & Charleston.—A. R. Davant has been appointed Traveling Freight Agent to succeed H. K. Faulconer, resigned.

Mexican Central.—A. L. Van Antwerp has been appointed Traffic Manager and H. Lawton, Assistant General Freight Agent. Both appointments were effected on Feb. 15. It is reported that the office of Eastern Traffic Manager in New York is to be abolished.

Mexican National.—D. P. Bennett has been appointed Auditor, to succeed R. B. Keys, resigned.

New Orleans & Western.—At a stockholders' meeting held in New Orleans on Feb. 9, the old Board of Directors was re-elected, with the addition of E. H. Farrar and W. E. Dotterer. At a subsequent meeting of the Directors, officers were elected as follows: President, William M. Smith; Vice President, W. W. Bierce; Secretary, D. B Morey; Treasurer, G. McD. Nathan.

Ohio Connecting—At the recent annual meeting of the stockholders of this road, a Pennsylvania Company organization, the present Board of Directors was re-elected as follows: President, James McCrea; John E. Davidson, J. T. Brooks, J. J. Brooks, J. M. Renner, L. L. Gilbert, Albert McKelvey.

Ohio Southern.—C. A. Chambers has been appointed General Freight Agent to succeed C. A. Barnard, resigned. E. W. Hiner has been appointed Assistant General Freight Agent, to succeed J. T. Odell, resigned.

Pennsylvania.—At the regular meeting of the Board of Directors, on Feb. 10, the following changes were made in the official staff, the action being due primarily to the death of President Roberts: John P. Green, promoted from Second Vice-President to First Vice-President; Charles E. Pugh, promoted from Third Vice President to Second Vice-President; Sutherland M. Prevost, formerly General Manager, made Third Vice-President; Joseph B. Hutchinson, formerly General Superintendent of Transportation, made General Manager; William H Joyce, formerly General Freight Agent, promoted to Freight Traffic Manager (the office being created for him); Samuel Rea, made First Assistant to the President; E. T. Postlethwaite and William A. Patton, made Assistants to the President.

Philadelphia, Wilmington & Baltimore.—The Board of Directors met on Feb. 12 and elected Frank Thomson, President; Charles P. Green, Vice-President; Charles E. Pugh, Second Vice-President; S. M. Prevost, Third Vice-President; Samuel Rea, First Assistant to the President; W. A. Patton and E. T. Postlethwaite, Assistants to the President; J. B. Hutchinson, General Manager, and W. H. Joyce, Freight Traffic Manager.

St. Louis & Salem.—Officers of this company have been elected as follows: President, John C. Irwin; General Manager, John Dean; Secretary, G. W. T. Reynolds; Treasurer, C. L. Walrath.

South Fayette.—The directors of this company, recently chartered in Pennsylvania, are as follows: James A. Hustead, President; John D. Boyd, Isaac W. Semans, Morgan H. Bowman, Thomas B. Semans, Albert D. Boyd and James R. Barnes, all of Uniontown, Pa.

Southwestern (Georgia).—At the stockholders' annual meeting, held in Macon, Ga., on Feb. 12, the old Board of Directors was re-elected, as follows: B. A. Denmark, Savannah, President: W. G. Raoual, J. F. Mims, W. R. Cox, J. M. Johnston, R. H. Brown, R. T. Wilson and F. B. Gresham. John Walker was re-elected Secretary and Treasurer.

Summit Branch.—Directors of this road, which forms a part of the Pennsylvania system, were elected on Feb. 9, as follows: Frank Thomson, John P. Green, Samuel Rea, N. Parker Shortridge, Amos R. Little, George Wood, William H. Barnes, A. J. Cassatt, William H. West and George F. Swift.

Tennessee Northern.—The following officers have been elected: President, A. A. Glasier, Boston, Mass.; Secretary and Treasurer, W. A. Fisher, Lawrence, Mass.

Texas Central.—The regular annual meeting of stockholders was held at Waco, Tex., on Feb. 10, and directors and officers elected as follows: Heny K. McHarg, Walton Ferguson, Stamford, Conn.; Amandee D. Moran, New York; Edward Rotan, J. S. McLendon, R. B. Parott and Charles Hamilton, Waco, Tex. President, Henry K. McHarg; Vice-President and General Manager, Charles Hamilton; Secretary and Treasurer, Richard Oliver; Assistant Secretary and Assistant Treasurer, D. Comyn.

Utah & California.—David Eccles, of Ogden-Utah, has been elected a director to succeed A. H. Cannon, deceased. R. L. Campbell, of Salt Lake City, has been elected Treasurer of the company to succeed Mr. Cannon.

Waynesburg & Washington.—The annual meeting of stockholders was held on Feb. 5 and the old officers re-elected. John E. Davidson, President, and J. J. Brooks, James McCrea, J. T. Brooks, John W. Renner, L. L. Gilbert, James P. Green, R. T. Downey, Abner Thorp, Jacob Swart. James S. Forsythe, Jonathan Allison and Julius DeMoyne, Directors.

West Jersey & Seashore.—At a meeting of the Board of Directors, on Feb. 12, Frank Thomson was elected President and a Director, to fill the vacancy caused by the death of George B. Roberts.

RAILROAD CONSTRUCTION.

Incorporations, Surveys, Etc.

Baltimore & Ohio.—The work of straightening the line at the point known as Seven Curves, eight miles east of Cumberland, Md., is being pushed. (See *Railroad Gazette* Dec. 25, 1896.) It was commenced last July by Charles E. Stewart and D. F. Keenan, contractors. Two of the three cuts have been finished and the third, which is the largest, is rapidly nearing completion. A fill about 350 ft. long is being made three miles west of Romney.

A third track is being laid for freight business from the yard at Martinsburg, Md., east eight miles to Kerneysville. This will give the road two eastbound tracks from North Mountain to Hobbs, W. Va., 20 miles.

Bay State Elevated.—A petition was filed at Boston, Mass., on Feb. 8, asking a charter for this company, to operate in Boston and vicinity. The persons named as incorporators are William B. Mack and James W. Longstreet. The capital stock is to be $10,000,000, and it is provided that on and after January, 1915, a franchise tax of not less than 1 per cent. and not more than 5 per cent. may be levied on the gross earnings of the company. This project is an old one, having been before the legislature in past years. The bill contains provisions that no part of the Common shall be taken, that no tracks shall be laid on Washington street between Dock square and Eliot street, on Tremont street between Scollay square and Eliot street, or on Copley square.

Boise, Nampa & Owyhee.—The latest reports from this road, which is being built from Nampa, Idaho, a station on the Union Pacific, south to Silver City and De Lamar, Owyhee County, state that tracklaying has been completed from Nampa to the Snake River, 18 miles. About 400 men and 100 teams are at work. John E. Stearns, Vice-President and General Manager of the company, has general supervision of all departments of construction. J. M. Clark is Chief Engineer. It is expected that work on a steel bridge across the Snake River will be begun shortly and tracklaying south of the river will be pushed as rapidly as possible. The distance from Nampa to Silver City is 41 miles.

Boston Elevated.—A bill was filed at Boston on Feb. 10 by this company, asking for power to make new locations, which will conform to and be used in connection with the subway now under construction. It is proposed to build three pieces of new line, one from Castle street, Roxbury, across the Boston & Albany Railroad, and under Pleasant street to the subway; another from Brattle square, Cambridge, across West Boston Bridge, up Cambridge street and through a subway to be built by the company, to Scollay square; the third will connect at West street and Harrison avenue, extend down Way street to Fort Point Bridge and across that to a connection with the South Boston branch. The main trunk line, following both the old and new locations, will be from Guild row, Roxbury, to Sullivan square, Charlestown. It will follow the old location from Roxbury until Castle street is reached, thence as above described to the subway, through that to the Causeway street terminal and thence as described to Sullivan street. The power used will be electricity. The provision for capitalization remains the same, not less than $10,000,000. The bill provides for a lease to the company of the West End Street Railway.

Brazos & Rio Grande.—This road was chartered in Texas on Feb. 8 with a capital stock of $100,000. The incorporators are Charles E. Hall, Fred. Stafford, F. A. Cummings, Robert McCorquodale, of Chicago; D. C. Plumb, of Fort Worth; D. W. Lloyd, of Marshall; John J. Warren, George J. Jordan, E. B. Stroud and Walter Collins, of Hillsboro. The company was incorporated to build a railroad from a point at or near Hillsboro, Hill County, Tex., southwest to a point at or near Hamilton, in Hamilton County, through the counties of Hill Bosque, Coryell and Hamilton. The distance in a straight line is about 60 miles. It is stated that $1,000 per mile has been subscribed. The principal office of the company will be located at Hillsboro.

Clayton & Pea Ridge.—Reports from Quincy, Ill., state that a contract for the construction of this road has been given to a Pittsburgh company. The road was chartered about five years ago, but no construction has been done up to the present time. The line will run from Clayton, Adams County, Ill., on the Wabash northeast to Pea Ridge, Brown County, about 15 miles. It is expected to open up coal mines at Pea Ridge. It is stated that work will be begun on the line in the Spring. The officers of the company are: President, George W. Montgomery; Vice-President, James B. Coe; Secretary, Charles Weaver; Treasurer, James J. Clark.

Erie.—The contract for double tracking the Greenwood Lake Division from a point on the Hackensack Meadows, where it leaves the Newark Branch just beyond the Hackensack River, northwest to Little Falls, N. J., a distance of 15 miles, has been awarded to William Nolan, of Reading. The work will be in charge of Charles Nolan. It is expected that it will be completed next fall.

Hillsboro & Northwestern.—Articles of incorporation of this company have been filed in Wisconsin. It is proposed to build a road five miles long from Union Center, Juneau County, a station on the Chicago & Northwestern, southwest to Hillsboro, Vernon County. The capital stock is $50,000, and the incorporators are W. W. Cargill, Wm. Lohmiller, Edwin B. Magill, George P. Bradish and Andrew E. Stevens, all of La Crosse, Wis.

Mexican Northern.—A dispatch from El Paso, Tex., states that surveys have been made for an extension of this road from Sierra Mojada, north 160 miles to Boquillas, on the Rio Grande River. The route selected is direct and will necessitate no steep grades. The line will run from Sierra Mojada through Animas, Charcos, and San Jose de las Piedras to Boquillas. From a point a little above Animas a branch has been laid out, running northeast through important mining centers near the west fork of the Sabinas River, thence northwesterly, reaching the main line again near San Jose de las Piedras. The road now extends from Escalon northeast to Sierra Mojada, 125 miles.

New York Central & Hudson River.—Regular train service over the new steel viaduct in Park avenue, New York, and the new Harlem river bridge, began Feb. 15. North of the river, that is, from about 136th to 149th street, the elevated roadway has been completed for only two of the four main tracks, the western half of the work having been necessarily postponed until the tracks on the old grade could be taken up. This north approach consists mostly of earth embankment, although there is a stretch of metal structure several hundred feet long at the 138th street station. The viaduct and bridge, of which several descriptions have appeared in the *Railroad Gazette*, was built in consequence of an act of Congress, which ordered that all bridges on the Harlem River should be raised so that ordinary tugs and river vessels could pass beneath. A new steel drawbridge was therefore built, giving a head room of 24 ft., and the steel viaduct in Park avenue was built to approach the draw. The present walled cut from 115th to 135th streeet will now be filled in and the street paved over. The work was begun nearly four years ago, and was practically finished last spring, but legal proceedings by property owners along the line have made many delays.

Oregon Short Line.—This is the title under which the old Oregon Short Line & Utah Northern has been reorganized. Articles of incorporation of the new company were filed at Salt Lake City, Utah, Feb. 10. The capital stock is $60,000,000. Walter C. Oakman, Samuel Carr and Henry C. Nichols are named as the principal incorporators. Reports from local newspapers state that one of the first moves of the new company will be to build an extension from Ironton, Utah, west to Clifton, in the Deep Creek mining region, about 100 miles.

Pittsburgh, Bessemer & Lake Erie.—Work has been begun on the branch which is to connect the Duquesne, Braddock and Homestead works of the Carnegie Steel Co. This branch will be known as the Union Railway. The line will pass through McKeesport and East Pittsburgh. At Duquesne preliminary grading has been begun, and is being pushed toward Homestead. At Homestead tracks are being laid along the river in front of the borough, the ballasting being done with slag from the steel works. It is expected that work on the Monongahela bridge at McKeesport will be under way before summer.

Portsmouth Belt.—Right of way for this line, which the New York, Philadelphia & Norfolk proposes to build, has been obtained, and it is stated that grading will begin shortly. The line will make a complete circuit through Portsmouth, Berkeley and Norfolk, Va., crossing the river just beyond Back Bay, near Nottingham & Wrenn's Works. Connection will be made with the Southern, the Norfolk & Carolina, Seaboard Air Line, Atlantic & Danville, Norfolk & Western and Norfolk & Southern roads. It has been decided to locate the northern terminus at Port Norfolk, where the company owns water-front property.

St. Louis & Salem.—Articles of incorporation of this company were filed in Springfield, Ill., Feb. 9. It is proposed to build and operate three lines, each starting from East St. Louis, Ill., one to run southeast to Belleville, St. Clair County, 14 miles; one east to Salem, Marion County, 70 miles, and one northeast to Edwardsville, Madison County, 28 miles. The principal office will be at East St. Louis. The incorporators are: John

G. Irwin, Edwardsville; John Dean, St. Louis, Mo.; C. L. Walrath, Lebanon Ill.; George W. T. Reynolds, East St. Louis, and James W. Findlow, St. Louis, Mo.

Sierra (California).—This company has been incorporated to build a road from Oakdale, in Stanislaus County, northeast to Angels Camp, in Calaveras County, a distance of 35 miles. Branch lines are to be run to Modesto, Knights Ferry, La Grange and Coulterville. The capital stock is limited to $5,000,000. The incorporators are Sidney D. Freshman, Edmund E. Simpson, John M. Bonner, Charles Gross and James Henry.

South Fayette.—This company was chartered on Feb. 12 to build a line from Smithfield, Fayette County, Pa., a station on the Baltimore & Ohio, north four miles to High House in the same county. The capital stock of the company is $40,000. A list of the directors is given in another column.

Southwest Texas.—Articles of incorporation of this company were filed in Texas on Feb. 12. It is proposed to build a line from Brenham, Washington County, Tex., in a general southwesterly direction to Brownsville, Cameron County, on the Rio Grande, passing through the counties of Washington, Colorado, Fayette, Lavaca, Victoria, Refugio, San Patricio, Nueces and Cameron; and another line from Corpus Christi, on the Gulf of Mexico, northwest to Eagle Pass, Maverick County, on the Rio Grande, passing through the counties of Nueces, Live Oak, McMullen, La Salle, Dimmit and Maverick. The total length of the two lines described will be about 550 miles. The capital stock of the company is $550,000. The directors are I. D Rogers, of New York; James Kerr, of Washington; William Muir, of New York, and Louis J. Worthan, Ben S. Rogers, D. McNeill Turner and George M. Edgerton, of Texas.

Winston-Salem Southbound.—A bill has been introduced in the legislature to build a road from Winston, Forsyth County, N. C., through the counties of Forsyth, Davidson, Davie, Guilford, Randolph, Montgomery, Rowan, Stanly, Cabarrus, Mecklenburg, Union and Anson. Lieut. Governor Reynolds and others who built the Roanoke & Southern are among the incorporators. The capital stock is to be $3,000,000 and subscriptions to stock may be voted by any county through which the road runs. Mr. Reynolds states that the company intends making a southern connection, but that it has not yet been decided whether the terminus will be Charlotte, Monroe or Wadesboro, N. C. The incorporators are: George W. Hinshaw, H. E. Fries, W. A. Lemly, J. W. Fries, Lindsay Patterson, F. H. Fries, C. B. Watson, R. J. Reynolds, E. B. Jones, A. E. Holton and others.

Electric Railroad Construction.

Bangor, Me.—A line is proposed from Buckfield to North Waterford, a distance of 23 miles, but no definite steps have as yet been taken.

Bridgeburg, Ont.—The International Ferry Co. and Fort Erie Ferry Railway Co. have made application to the council for permission to lay tracks along Niagara street from the Bridgeburg ferry dock to the southerly limit or boundary of the village.

Carlisle, Pa.—One of our correspondents informs us that at a recent meeting of the directors of the Cumberland Valley Traction Co. it was decided to construct the extension from Boiling Springs to Mount Holly, about five miles. The contracts for the ties, poles and wire have already been placed and an order for $10,000 worth of rails will be given out in a short time.

Chambersburg, Pa.—Under the terms of the ordinance, granting an electric railroad franchise in Chambersburg, the company must accept the ordinance within 60 days after its passage, and complete and operate the line within eight months from the time of its acceptance.

Chatham, Ont.—A special meeting of the Chatham City Council recently approved the proposed city and suburban electric railroad, and decided to submit a by-law to permit its construction at an early date.

Chelmsford, Ont.—Application is being made to the Ontario Legislature by E. Saunders, of Toronto, for an act to incorporate the Mineral & Timber Electric Railway Co., with power to construct a road from a point between the Chelmsford and Sturgeon Falls, northerly to a point on Wahnapitae Lake and southerly to a point on the northerly shore of Lake Huron, between the mouth of the French River and the village of Killarney, and also to a point on James Bay.

Fort Erie, Ont.—The Fort Erie Ferry Railway Co. is asking for an amending act, increasing its capital stock to an amount not exceeding $250,000, and authorizing the extension of its railroad from Fort Erie to a point in or near Chippewa.

Hamilton, Ont.—An electric road will be built from Hamilton to Bartonville, over the King Street road connecting with the tracks of the Hamilton Street Railway.

Harrisburg, Pa.—It is stated that the Harrisburg & Mechanicsburg Electric Railway Co. has secured all the private rights of way necessary and will build the extension from Riverton to Mechanicsburg this spring. This will give Harrisburg communication with Mechanicsburg.

Kennebunk, Me.—Arrangements are said to have been completed with the Mousam River Co. to extend the line to Cape Porpoise, through West Kennebunk, Kennebunk, Kennebunk Beach, Kennebunkport and Cape Porpoise. The legislature will be asked to make the necessary changes in the charter of the road. At Old Falls, seven miles below Sanford, on the Mousam River, a power-house will probably be erected.

Monson, Mass.—The proposition for a street railroad from Palmer, Mass., southward four miles to Monson, which was talked of a year ago or more, has been revived, and a petition is before the State Legislature asking for a charter. At last accounts, the projectors had not come to an agreement with the officials of the town of Monson regarding the terms of the franchise for occupying its streets. The proposed line would parallel the New London Northern road.

Montville, Conn.—The following are the newly elected directors of the Montville Street Railway Co.: Solomon Lucas, H. Barnes and W. L. Adams, of Norwich; W. Comstock, of Montville, and E. P. Shaw, Jr., of Newburyport, Mass. At a meeting of the directors subsequently held, Solomon Lucas, of Norwich, was elected President, and Charles W. Comstock Secretary and Treasurer.

New York.—The Third Avenue Railroad Co. presented an application on Feb. 10 to the Board of Aldermen for the right to build a branch from Third avenue to Ninety-ninth street and the East River, connecting with the Astoria Ferry. A second petition asked permission to build to the North River, and east from Amsterdam avenue through Ninety-sixth and Ninety-seventh streets, connecting with the Third avenue road. The Manhattanville & Forty-second Street Railroad Co. presented a petition for a new branch road from St. Nicholas avenue and 110th street to Lenox avenue, running thence northerly along Lenox avenue to the Harlem River. Another petition is for a branch through Seventy-ninth street, from Third avenue east to East End avenue, and from East Fifty-seventh street east from Third avenue to Avenue A, and thence north and along Avenue A to Eighty-sixth street. Another petition from the same company was an application for an entirely new road, beginning at the easterly terminus in East 125th street and running south along private property and Pleasant avenue south to 108th street. A public hearing will be given March 22, at 2 p. m., on the above applications.

St. Louis.—The ordinance granting a franchise to a company to build an electric road on Shaw avenue from Grand to Kings Highway has been referred to the Railroad Committee which will soon meet to hear arguments for and against the ordinonce.

The Mayor has vetoed the ordinance granting a franchise to the East St. Louis & Belleville Rapid Transit Co.

Toledo, O.—The Toledo, Bowling Green & Fremont Railway Co. has awarded a contract for the construction of its line through Bowling Green to Sawyer & Jonson, of Toledo. Work will be commenced Feb. 15, and pushed to completion. It is to be completed by March 25.

The Jacobson-Johnson syndicate of Detroit, is pushing the matter of right of way on the proposed line between Toledo and Monroe. There is now only a small amount of unsecured right of way. This company will build an independent line into Toledo. P. N. Jacobson and Wm. Johnson, of Detroit, and J. N. Bick, of Toledo, are interested.

Toronto, Ont.—At the next meeting of the legislature questions relating to street railroads will be considered as follows: Ingersoll Radial Railway Co., to construct electric road from Ingersoll to adjacent towns: Fort Erie Electric Railway Co., to increase capital stock of $250,000 and to extend the line; Lanark County Electric Railway Co., to build an electric road from Perth to Lanark, Desbarats & Northern Electric Railway Co., to operate a line in Algoma; Fort Francis & Pacific Railway Co., to construct a road in the Rainy River district.

Warren, O.—The Trumbull Electric Railroad Co., of Warren, announces that it will extend its line to Leavittsburg within 18 months, the County Commissioners having extended the limit of the franchise.

Washington, D. C.—The grading and laying of five miles of track on the portion of the Columbia & Maryland Electric Railway, which is in the District of Columbia, is about completed. On Feb. 12 Mr. W. K. Schoepf, the Receiver, awarded the contract for the overhead construction, which must be completed by March 1, in order to comply with the provisions of the charter. Nothing has yet been done with the line in Maryland from the District of Columbia line to Baltimore, and work has been suspended for some time.

Windsor, Ont.—The South Essex Electric Railway Co. is applying to the Ontario Legislature for power to build an electric road from Windsor to Sandwich, thence to Amherstburgh, Kingsville and Leamington.

GENERAL RAILROAD NEWS.

Atlantic & North Carolina.—The North Carolina Legislature has passed a bill restoring to the state the management and control of this railroad, two-thirds of whose stock it owns. This ends a litigation over the property which began last November, when the directors decided to lease the road to a new corporation, the Goldsboro & Morehead City Railway Co., without consent of the stockholders, who were opposed to the scheme. Governor Carr, whose term of office was about to expire, was in favor of the lease, and this, together with the fact that a Republican governor and a legislature opposed to the lease would soon be in power, were probably the main reasons the directors had for attempting to rush the transaction through. An injunction was obtained against carrying the lease into effect, which delayed proceedings sufficiently to allow the new power to settle the matter. The road extends from Goldsboro to Morehead City, N. C., over 100 miles, and is in reality an extension of the North Carolina road, the question of the lease of which by the Southern is now under discussion in the North Carolina Legislature, as stated in our last issue. A new President and Board of Directors will probably soon be appointed by the governor.

Atlantic & Pacific.—Jules S. Bache, William J. Quinlan, Jr., and Edwin Einstein, of New York, and Henry W. Dodd and N. W. Jordan, of Boston, have consented to act as a committee in behalf of the holders of Western division income bonds, whose protest against the action of the first mortgage bondholders in ratifying the purchase of their bonds by the Atchison, Topeka & Santa Fe was disregarded, as stated in our issue of Feb. 5. A deposit of $1.25 for each $1,000 bond is called for as a guarantee fund to meet expenses of the committee. William Strauss is counsel for the committee. There are $10,500,000 of these bonds out of a total issue of $12,000,000 still outstanding.

Baltimore & Ohio.—The Receivers have been authorized to lease 1,000 box cars from the Akron & Chicago Junction Railroad Co., the Missouri Car & Foundry Co. and the Fairport Warehouse & Elevator Co. The Baltimore & Ohio placed an order with the Missouri Car & Foundry Co. for 1,000 box cars in the name of the Fairport Warehouse & Elevator Co. last December. The cars to be leased are to be used on the lines of the Baltimore & Ohio, which is to pay mileage for them at the rate of six mills a mile, and collect that rate for their use by connecting roads.

Buffalo, Rochester & Pittsburgh.—In a circular recently issued the stockholders are asked to authorize an issue of $3,000,000 of debenture 6 per cent. bonds, of which $2,100,000 will be reserved for future capital requirements and the remainder will be used to fund the floating debt. Until the debt has been funded dividends on the preferred stock will not be resumed. The company has a floating debt of $900,000, incurred for construction and equipment, against which there is in the treasury $112,000 Erie Railroad 6 per cent. construction notes, received in payment for advances in double-tracking the Erie line between Mount Jewett and Johnsonburg. The notes are being paid off at the rate of $1,000 monthly.

Dansville & Mount Morris.—Operations on this road, extending from Dansville northwest to Mount Morris, N. Y., with branches, about 15 miles in all, were suspended on the night of Feb. 8. A judgment was obtained against the road in a suit involving the right of way through some swamp land, and the plaintiff tore up the track on this land, blocking traffic. The road has been in the hands of a Receiver since June, 1894.

Illinois Central.—The earnings of the company for the month of December and six months ended Dec. 31, were:

	1896.	1895.	Inc. or Dec.
December:			
Gross earn.	$2,104,066	$2,206,151	D. $102,085
Oper. exper.	1,327,113	1,322,073	I. 5,040
Net earn.	$776,953	$884,078	D. $107,125
Six months:			
Gross earn.	$11,451,988	$11,628,795	D. $176,807
Oper. expen.	8,031,341	7,422,542	I. 609,792
Net earn	$3,419,647	$4,206,246	D. $786,599

The estimated gross earnings for January, 1897, were $1,816,107, a decrease of $104,522, making $13,268,095 gross for seven months, a decrease of $281,329.

Intercolonial.—The total receipts of the road, operated by the Canadian government during 1896, were $2,957,640, and operating expenses $3,022,327, leaving a deficit of $55,187. There was an increase in the revenue of about $17,000 and in the expenditures of $62,526. This increase was largely due to the cost of improving the permanent way and works, $105,087 having been spent for these purposes. The net deficit on the Prince Edward Island Railway was $78,662 making a total of $134,449 on all government roads for the past year.

Lehigh Coal & Navigation Co.—The 76th annual report of the company has been submitted to the stockholders by President Lewis A. Riley. The report shows that the revenues from all sources for the year 1896 were $1,898,278. From this amount $1,339,730 was paid for general expenses, rentals, taxes and interest, leaving a surplus of $558,548. Two dividends, each of 2 per cent., were paid on the capital stock during the year and amounted to $573,866, leaving a difference of $15,318, which was charged to profit and loss. The earnings of the Lehigh & Susquehanna Railroad show a falling off during 1896 of $182,259 as compared with 1895. The net earnings from coal produced amounted to $226,845, and the total production of coal from the company's property, including that used in its operations, was 1,549,097 tons, which was 27,402 tons more than in 1895. The total shipments and local sales amounted to 1,399,955 tons. The profit from the coal operations was nearly all made in the last six months of the year. The business of the canals controlled by the company has fallen off somewhat from that of the previous year, and the report states that this loss was due to the delay caused by rebuilding dam No. 1, at White Haven, Pa., which was destroyed last March. The railroad loan of $2,000,000, which was due Feb. 1, 1897, has been extended until 1914, the holders agreeing to accept interest at the rate of 4 per cent. instead of 6 per cent. a year.

Manhattan.—The company reports earnings for the quarter ended Dec. 31 as follows:

	1896.	1895.	Inc. or Dec.
Gross earn.	$2,482,990	$2,498,114	D. $15,124
Oper. expen.	1,347,390	1,408,202	D. 60,812
Net earn.	$1,135,600	$1,089,912	I. $45,688
Other income	42,500	65 603	D. 23,103
Total	$1,178,100	$1,155,515	I. $22,585
Fixed charges.	866,838	846,390	D. 39 552
Balance	$371,262	$309,125	I. $62,137
Dividend	450,000	450,000	.....
Deficit	$78,738	$140,875	D. $62,137

Cash on hand, $62,717, and net profit and loss surplus, $4,282,346.

Memphis & Charleston.—In the foreclosure suit of the Farmers' Loan & Trust Co. of New York, trustee of the consolidated mortgage, Judge Lurton, of the Federal Court, filed at Memphis, Tenn., Feb. 11, a decree ordering the road sold for the benefit of the bondholders, unless the principal and interest of the consolidated mortgage (authorized, $4,700,000; issued, $2,266,000) is paid within 20 days. The suit was opposed by the Central Trust Co. of New York, trustee for $1,000,000 general issue mortgage bonds. In addition to the two named there are outstanding $1,048,000 first mortgage and $1,000,000 second mortgage bonds. The road went into the hands of Receivers in July, 1892. The main line extends from Memphis, Tenn., southeast to Stevenson, Ala., 272 miles, connecting with the Nashville, Chattanooga & St. Louis at the latter point, whose tracks are used to Chattanooga, Tenn., 38 miles distant. The company also owns two branch lines, one from Moscow north to Somerville, Tenn., 14 miles, and the other from Tuscumbia north to Florence, Ala., 6 miles.

Mexican Central.—The operations for the month of December were:

	1896.	1895.	Inc. or Dec.
Gross earn.	$1,015,920	$901,594	I. $114,326
Oper expen.	703,430	489,798	I. 213,632
Net earn.	$312,490	$411,796	D. $99,306

The reasons for the increase in operating expenses are that exchange on United States currency, material and expenses is considerably higher than a year ago, and renewals were also heavier. An increase of $114,326 in gross earnings is due to the fact that through freight, including imported corn, was heavy, though carried at low rates.

The operations for the year ended Dec. 31 were:

	1896.	1895.	Inc. or Dec.
Gross earn.	$10,208,020	$9,495,865	I. $712,155
Oper. expen.	6,744,273	5,599,390	I. 1,144,883
Net (Mex. cr.)	$3,463,747	$3,896,475	D. $433,728
Net (U. S. cur.)	1,833,785	2,063 156	D. 227,370
Misc. debits	25,000	25,000	.....
Balance	$1,810,786	$2,038,156	D. $227,370
Fixed charges.	2,306,600	2 306,600	.....
Deficit	$495,814	$268,443	I. $227,370

Northern Pacific.—Members of the underwriting syndicated were notified Feb. 14 to turn over to the manager, J. P. Morgan & Co., all of the prior lien 4-per cent. bonds held by them, and also $1,000,000 of the general lien 3 per cent. bonds. This means that the option upon those bonds as referred to in our issue of Feb. 5 (by error under the head of Union Pacific) has been exercised in respect to the entire $3,000,000 prior lien bonds remaining with the underwriting syndicate and also in respect to $1,000,000 of the general lien 3 per

cent. bonds. This leaves the underwriting syndicate with only $3,185,000 of the general lien bonds on hand, and it is understood that the option upon these is likely to be exercised in the near future. The purchaser of the bonds is believed to be the syndicate headed by the Deutsche Bank of Berlin that purchased all of the common and preferred shares of the reorganized Northern Pacific Company that accrued to the underwriting syndicate. The prices received for the bonds were 85 and interest for the prior lien 4's, and 53⅛ flat for the general lien 3s. At these prices the amount involved in the transaction is about $3,125,000.

On Feb. 16 Judge Jenkins entered an order in the United States Court at Milwaukee which completes the legal sale of the Northern Pacific Railroad Company's properties and the transfer to the Northern Pacific Railway Company. The order confirms the acts of Master Cary in executing the deeds to the property and disposing of the proceeds of sale. The property brought $18,105,200 nominally, but the exact amount is unobtainable owing to the numerous and intricate obligations it was bound to assume in complying with the terms of the decree.

Ohio Southern.—The Court has authorized the Receivers to make a second issue of receivers' certificates, amounting in all to $365,000. These certificates are a first lien on all the property of the road and are issued mainly to protect the equity of the company in equipment held under various car trusts, most of which have been paid up. The equipment covered consists of 16 locomotives, 6 passenger cars, 1 baggage car and 1,080 freight cars.

Oregon Improvement Co.—The operations for the year ended Nov. 30 were:

	1896.	1895.	Inc. or dec.
Gross earn	$3,211,621	$3,258,503	D. $36,88
Oper. expen	2,845,237	2,818,473	I. 26,764
Net earn	$376,384	$440,030	D. $63,646
Expen. and taxes	22,143	50,113	D. 27,970
Balance	$354,241	$389,917	D. $35,676

The company, which is in the hands of a reorganization committee, operates the Columbia & Puget Sound, Pacific Coast, Seattle & Northern, and Port Townsend Southern railroads, the Pacific Coast Steamship Co. and coal, real estate and miscellaneous properties.

Oregon Short Line.—In the notice of the incorporation of this company, given in another column, the authorized capitalization is given as $60,000,000. This amount was fixed in order to comply with the law of Montana, which prohibits the issue of bonds in excess of the authorized capital. The new company will have $36,500,000 bonds named in its new mortgage, of which part will be used to take up the $10,894,000 consols and the balance held in the treasury to retire prior liens; also $7,000,000 of A income bonds and $15,000,000 of B income bonds, making the total indebtedness authorized nearly $60,000,000. Therefore, the capital stock of the new company is placed at $60,000,000 authorized, but only $27,400,000 will be issued, as announced in the plan of reorganization. The balance can issue under the law only for cash or property.

Pennsylvania.—The operations of the lines directly operated east of Pittsburgh and Erie, for the month of December and six months ended Dec. 31, were:

	1896.	1895.	1894.
December:			
Gross earn	$5,192,304	$5,639,604	$5,153,789
Oper. expen	3,551,107	3,939,907	3,604,871
Net earn	$1,638,197	$1,699,697	$1,548,918
Six months:			
Gross earn	$62,096,577	$64,627,177	$58,704,283
Oper. expen	43,893,009	44,944,309	40,363,744
Net earn	$18,203,568	$19,682,865	$18,340,539

On all lines east of Pittsburgh and Erie the decrease in gross earnings for December is $552,600, and on all lines west of Pittsburgh and Erie the decrease is $627,100. This gives a total loss in gross earnings on the combined system of $1,179,700. In November the loss was $1,934,900.

St. Louis, Vandalia & Terre Haute.—The operations of the lines comprising the Vandalia system for the year ended Oct. 31 have just been made public and are as follows:

	1896.	1895.	Inc. or Dec.
Terre Haute & Indianapolis:			
Gross earn	$1,213,572	$1,236 5 5	D. $22 953
Oper. expen	1,016,881	959,943	I. 56,938
Net earn	$196,691	$276,582	D. $79,891
St. Louis, Alton & Terre Haute:			
Gross earn	$1,613,639	$1,735,950	D. $122,311
Oper. expen	1426,828	1,463,069	D. 36,241
Net earn	$186,811	$272,881	D. $86,070
Terre Haute & Logansport:			
Gross earn	$595,719	$680,619	D. $84,930
Oper. expen	514,193	558,494	D. 44,301
Net earn	$81,526	$122,155	D. $40,629
Terre Haute & Peoria:			
Gross earn	$403,559	$445,482	D. 41,926
Oper. expen	384,897	377,940	I. 6 957
Net earn	$18,662	$67,542	D. $48,880

Short Route Railway Transfer Co.—A decree has entered in the United States District Court of Louisville, Ky., ordering the sale of the property consisting of a double-track elevated road, 1½ miles long, extending in Fulton and Water streets from Preston to Fourteenth streets, Louisville, and the only means of entrance to the union station. It was opened for traffic May 14, 1884, and went into the hands of Receivers Jan. 1, 1894. The Southern, Illinois Central, Louisville, Henderson & St. Louis, Cleveland, Cincinnati, Chicago & St. Louis, Baltimore & Ohio Southwestern and the Chesapeake & Ohio roads have trackage rights and this line affords the means of interchange of traffic between the roads named and the Louisville & Nashville, Louisville, New Albany & Chicago, Pittsburgh, Cincinnati, Chicago & St. Louis and the Louisville, Evansville & St. Louis railroads. The Illinois Central is regarded as the most likely purchaser. The road forms the Southern connection of the Kentucky & Indiana Bridge Co.

Toronto, Hamilton & Buffalo.—Notice is given that an application will be made during the coming session of Parliament to enable this company to enter into an agreement with the Michigan Central or Canada Southern for the operation of a part of its line which extends from Welland to Waterford, Ont., 81 miles, connecting with the Michigan Central and Grand Trunk roads at Welland, and also with the latter road at Hamilton and the Michigan Central at Waterford.

Union Pacific.—At a meeting of the sinking fund (8 per cent.) bondholders, held in the office of the Union Trust Co., New York City, Feb. 10, it was voted to accept the new terms of the Reorganization Committee, which are 75 per cent. in new 4 per cent. bonds and 100 per cent. in 4 per cent. new preferred stock. The former offer was for 100 per cent. in new 4 per cent. bonds and 50 per cent. in new preferred stock. There are $3,730,000 of these bonds and the land assets behind them are valued at $5,700,000. The committee representing the consolidated mortgage bonds of the Kansas Pacific has issued a circular to the bondholders in relation to the decision of the Reorganization Committee of the Union Pacific to rescind its former proposition giving the Kansas Pacific consols 80 per cent. in Union Pacific new 4 per cent. bonds and 72 per cent. in preferred stock. The committee has also called a meeting of the bondholders to be held in New York City on Feb. 24 to consider the proposed curtailment of its interest under the reorganization to 50 per cent. in Union Pacific new 4s, and 110 per cent. in preferred stock. The Kansas Pacific Committee accepted the original offer of the Union Pacific subject to the ratification of the bondholders, and eventually the proposition was unanimously accepted. The committee will now, however, take a neutral position, and will leave everything to the bondholders. The committee is not a unit in opposing the modified terms offered by the Union Pacific reorganization committee, but does not feel justified in taking the responsibility of recommending their acceptance, in view of the radical change of plan.

Electric Railroad News.

Boston.—The directors of the West End Street Railway Co. have awarded the new issue of $2,700,000 for 20-year 4 per cent. construction bonds to Kidder, Peabody & Co., acting for a syndicate at 98.199. The syndicate is made up of several New York and Boston houses.

Chicago.—Mayor Swift has signed the ordinance granting the General Electric Railway Company a 20-year franchise on several streets on the south side, including Wabash avenue. By the terms of the agreement the city secures an average of 7½ per cent. of its gross receipts per year during the life of the franchise. One fare transfers over all the lines will be given and all overhead electric wires on any of the streets named in the ordinance must be abandoned.

The preliminary papers for the combination of the Fort Wayne Electric Co. with the Siemens & Halske Co., of Chicago, were signed about five weeks ago and the work of taking the stock inventory of the two concerns has been completed. The Fort Wayne Co. left the General Electric Co. in 1895.

The Appellate Court, in affirming the decree of the Superior Court of Cook County removing the Farmers' Loan & Trust Co. as co-trustee of the Lake Street "L" first mortgage bonds, has decided that an outside trust company must deposit with the Illinois State Auditor $200,000 in the same manner as the Illinois trust companies are compelled to do, and failure to do that makes them liable to removal.

Halifax, N. S.—The Halifax Tramway Co. report a surplus of $27,000 for the first six months that the road has been in operation.

Newtown, N. Y.—The town board has passed an ordinance providing that street railroads must obtain a license for running each car, the fee for which is $10 for each car. The ordinance goes into effect on April 1, and the penalty for a violation is $25 in each case. The Steinway Trolley Co. runs about 30 cars in Newtown, and 250 cars are stored in the power-house. The Brooklyn Heights Co. also has its power-house in Newtown, and many cars are stored in this building. The ordinance provides for the fee of $10 to be charged for those stored as well as for those in operation. It is said the railroads will test the constitutionality of the ordinance.

Raleigh, N. C.—The Raleigh Electric Co. has taken no definite steps to rebuild the power house which was destroyed by fire, as noted in our issue at the time. The Board of Aldermen has notified Charles Johnson, General Manager, that unless active work begins within 60 days the charter will be forfeited. There is talk of the formation of a new company to buy the franchise of the old street car company, and the city authorities are considering the advisability of buying its own electric light plant and operating it in conjunction with the street railroad power plant.

St. Louis.—Suit has been brought in the St. Louis courts asking for a Receiver for the St. Louis & Kirkwood Railroad, for the foreclosure of the road under the deed of trust held by the first mortgage bondholders, for the sale of the property to satisfy their claims, and for an injunction restraining the present managers of the road from interfering with the foreclosure proceedings or the sale.

San Diego, Cal.—A. D. Norman has been appointed Receiver for the Citizens' Traction Co., of San Diego, Cal. on petition of the Union Savings Bank & Trust Co., which holds $40,000 worth of the company's bonds on which the interest has defaulted.

Waterville, Me.—The Bangor *News* reports that I. C. Libby has sold out his interest in the Waterville & Fairfield Electric Railroad, Light & Power Co., to A. O. Lombard, who has been made general manager. It is proposed to put in a new power station and steam plant early in the spring.

TRAFFIC.

Traffic Notes.

Fifteen carloads of lead were lately shipped from Pueblo, Col., to Galveston and thence to Manchester, England.

The suit of the Interstate Commerce Commission against shippers in Milwaukee, alleging false statements of weight in shipments of malt, has been dismissed by Judge Seaman.

The Board of Control of the Joint Traffic Association met on Feb. 11 and elected Chauncey M. Depew, of the New York Central, to be President of the Board, to succeed George B. Roberts, deceased.

The San Antonio (Texas) Freight Bureau has been fully organized, and Mr. James M. Steere has been appointed Manager. Mr. Steere was formerly connected with the Gulf, Colorado & Santa Fe.

The traffic agreement of the Ohio roads carrying coal to Lake Erie, which was reported in the *Railroad Gazette* of Feb. 5, p. 100, has been ratified both by the railroad companies and by the shippers (the Ohio Coal Traffic Association).

Press dispatches from Galveston again report a blockade of grain, and the Missouri, Kansas & Texas has notified shippers that no more export grain can be received for that city until storage room is emptied.

The roads in the Southeastern Mississippi Valley Freight-Rate Committee have rescinded the changes recently made in the tariffs on grain to Southeastern Atlantic ports and to interior cities, reducing rates four and five cents, and the old tariffs will be restored Feb. 22.

A sleeping car is now run through daily between Cincinnati, O., and Hannibal, Mo., over the Cincinnati Hamilton & Dayton, the Indianapolis, Decatur & Western and the Wabash. A Pullman car runs one night and a Wagner car the next. In each car half the space is fitted and furnished as a sleeping car and the other half as a parlor car. These cars are new and have all the latest appliances.

General Manager Thorne and General Freight Agent Sargent, of the Texas & Pacific, were arraigned in the United States District Court at New Orleans, Feb. 16, and pleaded guilty to certain parts of the indictments found against them several weeks ago for violations of the Interstate Commerce law. The counsel of the Texas & Pacific entered the plea of guilty and presented extenuating circumstances in the case. The District Attorney, in view of the action of the railroad officials in not hampering the court by tedious quibbles and in furnishing all books and papers necessary to aid the government in its work, asked that they be fined and not imprisoned, but urged that a fine of not less than $3,000 be imposed.

The Cumberland Gap Dispatch, operating over the Norfolk & Western Railroad, with steamboat connections from Philadelphia, New York and Boston, has issued a reduced freight tariff to Western points. The new rates are on the basis of 60 cents, first-class New York and Boston to St. Louis, as compared with 77 cents before. The all-rail rate by direct lines is 87 cents. Henry Fink, President of the Norfolk & Western, says that the trunk lines have been making secret reductions in westbound freight rates. The Baltimore & Ohio appears to be the road most definitely accused. It is said that that road has lately succeeded in taking nearly ten per cent of the westbound trunk line freight, whereas, according to the *Journal of Commerce*, the agreement of the Joint Traffic Association provides for proportions as follows:

Railroad.	Per cent.	Railroad.	Per cent.
New York Central	23.0	West Shore	8 6
Pennsylvania	23.0	Baltimore & Ohio	7.4
Erie	17.5	N. Y., Ont. & W'n	1.5
Del., Lack. & W'n	10 2		
Lehigh Valley	8 8		
			100.0

Chicago Traffic Matters.

CHICAGO, Feb. 17.

A bad breach of faith on the part of one of the lines in the Western Passenger Association was discovered last week. It was on passenger business originating in Kansas City, and destined to and through Chicago and St. Louis. It appears that the Burlington made a deal with the brokers. Much bitter feeling was generated, and such a deal being exposed just as nearly all the leading roads in the country were working hard for the enactment of a law prohibiting scalping, very severe criticism was visited upon General Passenger Agents Eustis and Wakely, who are credited with engineering the deal. Chairman Caldwell called a meeting of the General Passenger Agents in St. Louis on Friday last and succeeded in pouring oil upon the troubled waters. The result of a stormy meeting was that the Chairman was instructed to reduce the rate to and through Chicago and St. Louis from Kansas City whenever he deemed such action necessary to meet any competition originating through deals with brokers. This radical action had the effect of immediately straightening out matters.

Chairman Midgley, of the Western Freight Association, will, at the end of this week, begin his postponed European trip, which will extend to the far east. He will be gone three months. During the time he is absent Mr. F. A. Parker, one of the Board of Administration, will be acting Chairman of the Association.

Eastern roads are sufferers from manipulation of drovers' passes. The scalpers, working in connection with the shippers are making rates of $10 to New York and Boston, $7 to Buffalo and Pittsburgh, and $9 to Washington. It is said that every broker in Chicago has such transportation for sale. It is understood that the roads will adopt a descriptive form of ticket for persons traveling with stock.

Roads west of Chicago which have refused to make reduced rates to the inauguration at Washington have been compelled, by action taken by the Chicago & Alton, to make a rate of one fare for the round trip. Several have already given notice that they will meet the Alton's rate.

Western Passenger Association lines are voting on a proposition to make a round-trip rate of one fare and a fifth to the Corbett-Fitzsimmons prize-fight in Nevada, in connection with the reduced rate agreed upon by the Southern Pacific; and the prospects are that the rate named will be adopted.

Total collapse threatens the Chicago-St. Paul passenger agreement. Several of the weak lines claim that they are losing business by remaining in it. The trouble is that there is not enough controllable business to give them the percentages allowed them. Though the controllable business has been turned over to them for months, they have not secured more than about one-half their allowance, and there is little probability of their being able to make up what they are behind.

Eastbound shipments from Chicago and Chicago Junctions to points at and beyond the Western termini of the trunk lines for the week ending Feb. 11 amounted to 117,780 tons, as compared with 120,927 tons the preceding week. This statement includes shipments of 67,198 tons of grain, 11,282 tons of flour and 9,959 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	Week Ending Feb. 11		Week Ending Feb. 4	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio	8,325	7 1	5,520	4.6
C., C., C. & St. Louis	9,171	7 8	13,066	10.8
Erie	13,275	11.3	8,358	6.9
Grand Trunk	8,845	7.5	8,382	6.9
L. S. & M. S.	14,008	11.9	17,253	14.3
Michigan Central	17,694	15.0	13,793	11 4
N. Y., Chi. & St. L	9,407	8.0	8,777	7.3
Pitts., Cin., Chi. & St. Louis	11,150	9.4	14,419	11.9
Pitts., Ft. Wayne & Chicago	18,153	15.4	24,656	20.4
Wabash	7,752	6.6	6,703	5.5
Totals	117,780	100.0	120,927	100.0